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A P P E N D I X I.

TO

SECOND REPORT OF COMMITTEE

UPON

T H E F E V E R H O S P I T A L

AND

MUNICIPAL IMPROVEMENTS:

CONTAINING

**CORRESPONDENCE RESPECTING THE WARPING AND DRAINING OF THE SALT WATER LAKE
AND THE UNHEALTHINESS OF THE ENVIRONS OF CALCUTTA, ETC.**

CALCUTTA :

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APPENDIX (I)

No. 1.

TO THE HONOURABLE SIR J. P. GRANT.

DEAR SIR,

The exceeding difficulties of the subject, together with want of time to enter more fully into it, must constitute my excuse for the many deficiencies of the accompanying Note.

I have, however, as far as possible, avoided mere opinions, even those of the ablest authorities; and stated only what I conceive to be the well attested results of operations undertaken with a view to improve climate and agricultural resources in various parts of Europe, where many more examples might be furnished. Unhappily, but little has been done within the tropics on which to ground determinate plans; but perhaps the scientific officers of this City may be able to furnish precise information respecting the System of Draining in actual operation in British Guiana, of which Dr. Fergusson speaks so highly: if so, we may I think rely on it as an example which may with safety be followed.

Yours very truly,

J. R. MARTIN.

NATIVE HOSPITAL,
10th June, 1839.

No. 1. (A)

Note on the Draining of the Salt Water Lake.

Next in importance to the Great Works required in and about the City of Calcutta, to render its climate comparatively salubrious, the Clearing of the Sunderbunds and the Draining of the Salt Water Lake claim our notice.

Extending 180 miles South and East of us, and covering a superficies of 20,000 square miles and upwards, the Sunderbunds must necessarily exercise a very powerful influence on the electric condition of our atmosphere; besides loading it with all kinds of exhalations. That the clearing of this vast surface, therefore, would tend greatly to improve our local climate, cannot be doubted by any one who considers the question in reference to the history of this City, or that of the effects of similar operations in other countries. It would open our locality to the free influence of the sea breezes; diminish the moisture of our atmosphere, and greatly purify it. It is a popular as well as medical belief in malarious countries, that by diminishing the humidity of the air we at the same time diminish its capacity for the marsh poison—a watery or moist atmosphere being the active repository and

conductor of such exhalation. When the humidity is dissipated by the noon-day sun, the malaria is checked in progress, possibly in its production. Here we have the reason of Dr. William Fergusson's assertion, that it is "during the cooler temperature of the night that it acquires body, concentration, and power." It is also very remarkable that malarious exhalations are "*certainly lost and absorbed by passing over a small surface of water.*" It is found also, contrary to the vulgar opinion, that in clearing and cultivating tracts such as the Sunderbunds, the air is rendered drier and warmer in summer, and colder in winter, than in such as, from want of cultivation, remain covered with wood and marsh.

If then, to counterbalance some little increase of temperature, we obtain purity, dryness, and freedom of ventilation in our atmosphere, we shall still be very greatly the gainers; for it is not so much from a high range of temperature we suffer, as from the excessive humidity, and other qualities conjoined to it, for so many months of the year, all which tend gradually to undermine, through their united influence, the best and most robust of European constitutions.

The Salt Water Lake.

Amidst the obscurity which envelopes the early physical history of this City, it is difficult, if not impossible, to discover the changes that have been effected by time in the condition and extent of the Salt Water Lake; but from Captain Hamilton's notice of it, as well as from tradition, I am induced to believe that in former times it was far deeper, and more extended than we now find it, and indeed, that it came up quite close to the Eastern boundary of Calcutta; and I have even heard of the existence in some Publick Office of an old Map* which so represented it. The reclaiming of the land now covered by the Lake is a measure of great importance; but especially the mode of doing it, as affecting the salubrity of this City.

To reclaim the ground for the purposes of agriculture is easy; but to deprive it of the character of marsh, and thus retain it, is not so; it may therefore be well that I state what medical authors define to be marsh, in so far as it affects human health.

Character of marsh according to Dr W. Fergusson.

Dr. William Fergusson, Inspector-General of Hospitals, and the most distinguished of the many writers on this particular subject, states, that "the marsh must cease to be a marsh, in the common acceptance of the word, and the sensible putrefaction of water and vegetables must alike be impossible, before its surface can become deleterious." To render these seemingly paradoxical statements intelligible, Dr. Fergusson gives a review of the circumstances which, under his own observation, attended the British army on various services and expeditions in Holland, the West Indies, Spain, and Portugal.

This distinguished Military Physician states that a previous marshy surface, or rather the previous abundance of water, is an indispensable requisite, in all situations, to the productions and evolvment of the marsh poison; and that a healthy condition of soil is infallibly regained by the restoration of the marshy surface in its utmost vigour of vegetable growth and decay. So unessential does he consider putrefaction, or the humid decay of vegetables, under any sensible or discoverable form, towards the production of miasmata.

The ground of encampment which nearly destroyed the British Army on the plains of Estremadura "was so arid and dry, for want of rain, that the Guadiana itself, and all the smaller streams, had in fact *ceased to be streams*, and were no more than *lines of detached pools* in the courses that had formerly been rivers." Many more instances of aggra-

* Possibly the Survey by Capt. Claude Martin, made it is supposed in the year 1760, and lodged in the Office of the Surveyor General. This Survey points out certain spots of ground in the Lake to which wild Buffaloes resort.—J. M.

vated fevers are given by Dr. Fergusson, in situations "as dry as a brick-ground, with the vegetation utterly burned up."

In all the situations described, but especially in Holland, though the surface was invariably quite dry, water was found a very short way below it. Again, in the West Indies, where Dr. Fergusson, made a topographic health survey in 1815-16 and 17, he found that general dryness of soil is "far from being the ordinary characteristic. The swamp is too often exposed to the continued operation of a tropical sun, and its approach to dryness is the harbinger of disease and death to the inhabitants in its vicinity. On the whole it may truly be said, that although excessive rains will evidently cause the acknowledged wholesome and unwholesome soil to change places for a time in respect to health, a year of stunted vegetation, through dry seasons, and uncommon drought, is infallibly a year of pestilence to the greater part of the West India Colonies.

To assert, after this, that the putrid marsh, which must necessarily, to a certain degree, be a *wet* one, is positively less dangerous than another where no smell exists, will not, I am sure appear paradoxical; for it is only saying, that the first has not yet arrived at the degree of exsiccation that has been found most productive of the marsh poison, and that putrefaction, though it may, and must often, precede and accompany pestilence, is no part of pestilence itself.

Dr. M'Culloch defines marsh to be as follows :

"The essential character of all marshes and swamps, as far as we yet can decide, is, that the land should be partially inundated, that it should be dry in some places and wet in others, or that pools and dry spots should be intermixed, or that it should be boggy and soft from the mixture of earth and decayed vegetables with water, or that it should be subject to peculiar alterations of moisture and dryness, sometimes amounting to absolute inundation in the first case.

The great importance of the subject will, I trust, excuse the length to which I have carried definitions and descriptions, and I shall now, but with great diffidence, proceed to offer some hints on what I conceive to be the proper mode of proceeding with the Salt Water Lake.

To drain the Lake for the purpose of native agriculture is, as I have said, easy ; but to deprive the level grounds of the sources of noxious exhalation is not so. It is not sufficient to convert the ground into a state of soft low meadow land, for the most dangerous exhalations are those which are retained, and occasionally emitted from under a crust of earth during the drying process, whereby they would appear to acquire unusual concentration, and prove the origin of the worst fevers.

It is necessary that the ground be thoroughly drained, leaving none of the characters of marsh, otherwise it had better be left as it is ; its present condition being one of far greater safety than such half-drained soil as that obtained from the marsh of Chartreuse, for instance, near Bordeaux, which caused in the year 1805 alone 12,000 persons to be affected with fever within the city, of whom 3,000 died in five months.

Two modes of effecting the Drainage suggest themselves ; the one by letting in the River during the rains, and thereby gaining a succession of deposits of the river silt, so as gradually to fill the inequalities of the ground now occupied by the lake, and thereby bring it in time to a level with the surrounding land. This would seem the easiest ; it imitates the simple operations of nature, and would be the cheapest ; but perhaps not the most conducive to health. Another mode is, by a deep and well constructed canal,

Dr. M'Culloch's definition of marsh.

Mode of draining the Lake.

Necessity of a thorough draining.

Injury to health at Bordeaux from partial draining.

Different modes of effective drainage.

so as to effect the drainage; but as even this must, to a certain degree, prove a receptacle for noxious matter, and offer a considerable surface for evaporation, a close line of umbrageous trees should be planted along each side of the canal, as being powerfully attractive of marsh exhalation.

This property in trees was practically known to the ancients,* and is now beneficially exemplified in Demerara, and other parts of Guiana, "where the humid heat cherishes the seeds of disease." Dr. William Fergusson states, that the marsh poison can with difficulty be separated from trees; "and in the territory of Guiana, particularly, where these trees abound, it is wonderful to see how near to *leenard* of the most pestiferous marshes the settlers, provided they have this security, will venture, and that with impunity, to place their habitations."

Great importance of the subject as affecting public health.

The ground cleared from water, should be well ploughed and cultivated, the ploughing to be done during the heaviest rain, so as to prevent exhalation; for it is during a certain stage of the *drying process*, that marsh exhalation is most concentrated; and it has been observed in many countries, that the drying up of brackish water is more injurious than that of either salt or fresh alone. A succession of crops purifies and evaporates the soil, and thereby obviates exhalation; but they should not be of rice, or such crops as require profuse irrigation. The want of attention to some of the precautionary measures above hinted at, has neutralized the advantages that would otherwise have resulted from extensive draining executed in some parts of France and Italy; and I have only thus long dwelt on that of the Salt Water Lake, because I believe its proper performance to be a matter of great importance to this City, as far as regards the prevention of disease; and I need not here insist on the superior efficacy of *preventive* measures, such as have advanced in our own country apace with our civilization, and altogether banished from us some of the severest calamities that have ever afflicted the human race.

Conclusion of Dr. Fergusson.

To conclude this part of the subject, I shall state the remedy for the existing state of the Sunderbunds and Salt Water Lake in the words of Dr. William Fergusson, believing that it applies with equal force here as in the western hemisphere. It is cultivation, which he says, acts, by ever "opening the surface for the escape of pestilential gases, and exhausting the morbid principle by a constant succession of crops; for wherever malaria prevails, the uncultivated savannah, even though used for pasture, becomes infinitely more pestiferous than the plantation; and the depopulated country falls completely under its dominion. With the aid of the purifying sea-breeze, this course at the British colony of Demerara, within six degrees of the equator, has succeeded in rendering the cultivated portion of the deepest and most extensive morass probably in the world, an healthy, fertile, and beautiful settlement. I shall not here enter into a detailed account of the astonishing system of tide and floodgate drainage by which this delightful result has been established and kept up, but hasten to a conclusion.

Results of draining operations in other countries.

Having stated my general opinion on the modes of effecting the clearing and draining of the grounds in our vicinity, and especially on that of the Salt Water Lake, I shall proceed to state briefly what is known practically of the effects of similar operations in other countries, such information being more useful than mere opinions, however ably set forth.

It is a subject of regret that the physical history of ancient times is even more im-

* Regond de L'Isle says of the malaria of Italy, that various obstacles form barriers which they cannot pass, and against which they deposit themselves.

perfect than the political history; and in the place of exact and uninterrupted records of natural phenomena, from which alone any safe conclusions can be drawn, we have only scattered notices; yet these, such as they are, can be rendered of great use by means of comparison. It is only by receding upwards from our own time, and thus discovering a gradually greater prevalence of disease; and again in finding the amelioration reversely following very accurately the progress of agricultural improvements, that the whole conclusion appears to be amply justified. Examples of the latter are without number in every European country, but comparatively little has been done within the tropics.

There can be no doubt that the forests of the Apennines, and in Etruria and Latium, from their great extent in ancient times, caused an increase of rain, and consequently large accumulations of Water in the low grounds, which would still further increase the coldness of the atmosphere: indeed, it is evident from the language of the ancient writers, that, in their days, the cold of the Roman winter was greater than it is at present. Again, the cold of winter is perfectly consistent with great heat in the summer; and though the summer heat of Italy may have been much the same in ancient times as it is at present, yet the difference between the temperature of summer and winter, must have been much greater than it is now. Dr. Arnold, whose history of Rome is here referred to, considers at some length the question. Whether the greater cold of winter, and the greater extent of wood and undrained waters which existed in the times of the Romans, may not have had a favorable influence in mitigating that Malaria which is now the curse of so many parts of Italy, and particularly of the immediate neighbourhood of Rome.

"On a subject so imperfectly understood, even by those who have had the fullest experience, it were most unbecoming in a foreigner to speak otherwise than with the greatest diffidence. We know, however, that the Campagna of Rome, which is now almost a desert, must, at a remote period, have been full of independent Cities; and although the greater part of these had perished long before the fourth century of Rome, yet even then there existed Ostia, Laurentum, Ardea, and Antium on one side, and Veii and Cære on the other, in situations which are now regarded as uninhabitable during the Summer months; and all the lands of the Romans, on which they, like the old Athenians, for the most part resided regularly, lie within the present range of the Malaria."

Dr. Arnold on the
Campagna of Rome.

Some have supposed, that although the climate was the same as it is now, yet the Romans were enabled to escape from its influence, and their safety has been ascribed to their practice of wearing woollen next to the skin, instead of linen or cotton. But not to notice other objections to this notion, it is enough to say that the Romans regarded unhealthy situations with the same apprehension as their modern descendants: it is one of the first cautions given by Cato and Varro to a man going to purchase land, that he should buy only where the air is healthy; "otherwise," says Varro, "farming is nothing else than a mere gambling with life and property." The truth seems to be, that the Malaria, although well known and extremely fatal, was much more partial than at present, and that many spots which are now infected, were formerly free from it. "The whole of Latium," says Strabo, "is a flourishing and very productive country, with the exception of a few spots near the coast, which are marshy and unhealthy." And again, when speaking expressly of the Campagna between the Alban hills and Rome, he says, "that the parts towards the Sea are not so healthy—but that the rest is a good country to live in, and well cultivated accordingly." "Now although this is probably going too far, for the unhealthy spots could not have been confined altogether to the Sea-coast, yet, with every allowance

for exaggeration and careless writing, this is a description of the Campagna which no man in his senses would think of giving now.

Cicero and Livy on the same subject.

On the other hand, Cicero and Livy both speak of the immediate neighbourhood of Rome as unhealthy, but at the same time they extol the positive healthiness of the City itself; ascribing it to the hills which are at once airy themselves, and offer a screen to the low grounds from the heat of the sun. Bunsen, also, after an experience of many years, gives a favorable account of the healthiness of the City itself. "The site of Rome," he says, "taken generally, may be called healthy;" it is true, that one of the most unhealthy parts of modern Rome, the Piazza di Spagna, and the slope of the Pincian hill above it, was not within the limits of the ancient city. Yet the praise of the healthiness of Rome must be understood rather comparatively with that of the immediate neighbourhood, than positively. Rome in the summer months, cannot be called healthy, even as compared with the other great cities of Italy, much less if the standard be taken from Berlin or from London.

Important conclusions of Dr. Arnold.

Again, the neighbourhood of Rome is characterized by Livy as a "pestilential and parched soil." The latter epithet is worthy of notice, because the favourite opinion has been that the Malaria is connected with Marshes and with moisture; but it is precisely here that we may find, I think, the explanation of the spread of the Malaria in modern times. Even in Spring nothing can less resemble a Marsh than the present aspect of the Campagna; it is far more like the down country of Dorsetshire; and as the Summer advances, it may well be called a dry and parched district. But this is exactly the character of the Plains of Estremadura, where our soldiers suffered so grievously from Malaria Fever in the Autumn of 1809. In short, abundant experience has proved, that when the surface of the ground is wet, the Malaria poison is far less noxious than when all appearance of moisture on the surface is gone, and the damp makes its way into the atmosphere from a considerable depth under ground. After a wet and cold summer, in 1799, when the whole face of the country was nearly flooded with water, the British army remained the whole Autumn in one of the most unhealthy parts of Holland, without suffering in any remarkable degree from Malaria fever. But in 1809, when the summer had been hot and fine, every one remembers the deadly effect of the Autumn fevers on the soldiers who were holding Walcheren. If then more rain fell in the Campagna formerly than is the case now; if the streams were fuller of water, and their course more rapid; above all, if owing to the uncleared state of central Europe, and the greater abundance of wood in Italy itself, the summer heats set in later, and were less intense, and more often relieved by violent storms of rain, there is every reason to believe that the Campagna must have been far healthier than at present; and that precisely in proportion to the clearing and cultivation of central Europe, to the felling of the woods, the shrinking of the streams, and the disappearance of the water from the surface, has been the increased unhealthiness of the country, and the more extended range of the Malaria.

It must be observed also that the present desolation of the Campagna, and even that comparative want of population which prevailed in it during the latter times of the Roman Republic and under the Empire, are not wholly to be attributed to Physical causes. The aguish districts of England continue to be inhabited, nor have the terrors of the yellow fever driven men away from the unhealthiest situations of the West Indies, or from Vera Cruz, Acapulca, or Carthagena.

The old Cities of the Campagna would have continued to defy the Malaria; their

population would have been kept down indeed ; many of their children would have died young, and the average length of human life would have been far short of threescore years and ten ; but men do not readily leave their country, and they would have continued as their fathers had done before them, to struggle with disease and death. When however, political causes had destroyed the Cities of the Campagna, one after the other, and the land became the property of Roman citizens ; when again, at a latter period the small properties disappeared, and the districts fell into the hands of a few individuals, then it was natural that those who could afford to live where they choose, should not fix themselves in a spot of even partial unhealthiness, and thus a great part of the Campagna was left only to the slaves by whom it was cultivated. In modern times, when slave labour was no longer to be had, and there were no attractions strong enough to induce a free population to migrate from their homes to an unhealthy district, the Campagna has remained a wilderness, and its harvests are reaped by a temporary immigration of labourers from other parts of the country. To re-people it under such circumstances, is far more difficult than to keep up a population already existing ; and if, as I believe, the physical state of the Campagna has become more and more unfavorable, it seems likely, without some extraordinary advances in our knowledge of the Malaria, and in our ability to combat it, to remain a wilderness for ever.

The disorders produced by Malaria, whether more or less fatal, so regularly accompanied the return of hot weather, that they were not likely to be recorded in the annals. The diseases which were noticed there, were of a very different character, and belonged rather to another class of phenomena—those extraordinary sicknesses which, in obedience to a law hitherto undiscovered, visit the earth at different periods, prevail more or less extensively, and acting independently as it seems of any recognized causes of disease, are also beyond the reach of all known remedies.”

Disorders produced by Malaria accompanying the hot weather.

In many parts of Italy, as described by M. Georgini of Lucca, Marshes, even when close together, and consequently under the same climatorial circumstances, are not equally inimical to human health and human life. In certain parts also the vicinity of Marshes does not diminish the fertility or the population over which in other localities it exercises the most baneful powers. It was long ago conjectured, but not proved, that admixture of Sea-water with that of Marshes increased the malignity of exhalations issuing thence, and the problem would now appear to be solved by events which have taken place in Italy.

Descriptions of M. Georgini of Lucca.

Between the Ligurian Apennines and the Mediterranean, lies a marshy tract of coast, about twelve Italian miles in length, and varying from two to four in breadth, traversed by several mountain streams or rather torrents, which are discharged into the Ocean, or into the Morasses bordering thereon. The marshy plain in question may be considered as an alluvion deposited by the rivers Arno and Serchio, and is bounded on the Sea line by a sort of embankment, only a few feet above the level of the Ocean. The waters collected by the rains, &c. are discharged from three basins into the Sea by natural or artificial Canals. The level of the stagnant waters is below high-water mark, and somewhat above the Ocean during ebb tide.

In consequence of this circumstance, and before any hydraulic works were constructed the flood tide changed the currents of the different exutories and caused them to run backwards into the morasses, mixed of course, with a proportion of Sea-water. While this was the state of things, the population of this wretched district was very scanty ; and Viareggio,

now a large town, consisted of only a few huts. The natives, who were few in number, were constant victims to diseases of the liver and spleen, the children were sickly, and old men were no where to be seen. The unhealthiness of the place had, in fact, arisen to such a height, that the culture of the olive tree, with which this fertile tract abounded, was almost entirely abandoned to strangers, who of course fell annual victims to the Malaria of the Marshes. Various attempts were made to remedy the evil, and at length about the year 1741, a complete stop was put to it, by the construction of Valvular Gates, which permitted the efflux of the waters from the Marshes, but prevented any reflux of water from the Ocean. The effect was instantaneous and surprising. The insalubrity disappeared [when] these flood gates were completed, and only partially re-appeared when they were out of order, and permitted the admixture of Salt and Fresh water in the Marshes. Viareggio is now so salubrious as to be much frequented by the neighbouring wealthy inhabitants, as a place for sea-bathing, and enjoying the delightful sea breezes in the heat of summer. The population has rapidly increased, as a matter of course, since the happy change in the climate; and Viareggio, which in 1733 contained only 330 inhabitants, now shews a population of between 4000 and 5000.

On the account above given Dr. James Johnson observes, that, without doubt, this fortunate change was owing to the means above mentioned; nor can it be denied that the admixture of Salt and marshy water may have a deleterious influence in the production of Malaria; but it is also unquestionable, that the most deleterious exhalations issue from morasses which have no communication whatever with the Sea.

Dr. Wetherhead conceives that to the character of the soil (an important element in climate every where) in and about Rome, must be ascribed its peculiar insalubrity; for he states that it is permanently moist all the year round, a few inches under the surface.

The practical application of all that has here been urged, cannot be difficult; and I should hope that the singularly successful system of Draining, spoken of by Dr. William Fergusson as now existing in the level country of British Guiana, may be made applicable to the wants of our locality.

NATIVE HOSPITAL,
Calcutta, June 10th, 1839.

J. R. MARTIN.

No. 2.

DEAR SIR,

In continuation of my former Note on the subject of the Salt Water Lake, I beg to subjoin the following Memoranda, collected from the Statistical Reports on the sickness and mortality of the British troops in the Colonies, published by authority of Parliament.

Speaking of the climate of the Ionian Islands generally, the Statistical Report of 1839 contains as follows:—"It should be observed that within the last six years, a very great reduction has taken place in the mortality of the troops; indeed, during that period the average has been lower than in Malta or Gibraltar, and this improvement has extended to all the Islands of the Command. To what causes so marked a change in the character of the climate is attributable we profess not to decide; but can only state that, during this

period, great improvements have taken place in the Barrack and Hospital accommodation at several of the Stations; fewer soldiers have been employed in working on the roads; agriculture has made considerable progress in many Districts which formerly lay waste; and several of the Lakes and Marshes, formerly supposed injurious to health, have been drained and converted to available soil: all of which circumstances may have exerted considerable influence in this respect."

It is proper to state, in reference to the above quotation, that the authors of the Statistical Reports named, seem every where studious to avoid assigning any specific cause for the fevers, whether endemial or epidemic, which are found to prevail in the several British Colonies—and marshes, lakes, lagoons, salines, &c. are spoken of generally as "supposed" causes of disease.

Respecting the Island of Santa Maura, the authors, though remarking on the little certainty there exists regarding the real cause of remittent fever, and fully impressed with the difficulties of the subject, state nevertheless as follows:—"It will be observed that the prevalence of febrile diseases in this climate has of late undergone a very remarkable change: in 1832, for instance, there was no fatal case, and in 1835 but one, and not a twentieth part as many were attacked as formerly, yet the temperature was as high as in those years when fever most abounded. Within that time great improvements had taken place on the Lake, by increasing its depth, contracting its extent, and bringing a portion of the banks under cultivation, which may have had considerable influence on the health of the troops in its vicinity."

At Cephalonia, the troops became "remarkably healthy," after being removed from "the Southern extremity of the Town," (Argostoli) "nearest the marsh of Cutano," where also the barrack accommodation was defective. The high rate of mortality amongst the troops in Cephalonia (30.5 per thousand of strength annually) is distinctly ascribed by the authors "to the unhealthy locality in which they were quartered," and not "to the climate of Cephalonia, which, so far as regards the inhabitants at least, appears as healthy as any of the Ionian Islands; indeed, there is good reason to believe it is nearly as much so as Britain."

The Report then goes on to say, that the portion of the inhabitants who occupy "the highland districts, are said to possess a much more robust and healthy appearance than in the other Islands,—and though in the low grounds they occasionally suffer from remittent and intermittent fevers, those do not seem by any means of so fatal a character as among the troops. We find it recorded by Dr. Hennen, for instance, that in the epidemic of 1816, out of 12,000 of the inhabitants attacked, only 50 died throughout the Island; while, of 220 soldiers attacked, 80 died in the Town of Argostoli alone."

It is worthy of remark, again, that throughout the Ionian Islands two measures of prevention only are mentioned, namely, the deepening of Shallow Lakes, or else the reclaiming them for purposes of agriculture.

Throughout the entire Ionian command, fever is both the most fatal and prevalent disease, the rate of deaths to admissions into Hospital being very high in all the islands; and in the Island of Zante the deaths, in 1814, were 1 in 3, "being as large a proportion as by the worst description of yellow fever in the West Indies."

In the Island of Santa Moura the ratio of deaths by fever during twenty years has been higher even than in the Windward and Leeward command; in the proportion of 36 to 37, "and so general has been its prevalence, that 74.9 per thousand of the troops have

been attacked annually, while in the Windward and Leeward command the average proportion attacked, out of the same number of troops during that period, was 717."

Though the mortality throughout the Ionian Islands generally, is so much higher than either in Gibraltar or Malta, there is no corresponding increase in the proportion of constantly sick, and the same has been said of both the East and West Indies, where the diseases are mostly of a febrile character, and run rapidly to a termination.

The influence of Season in producing sickness and mortality in the Ionian Islands, is strikingly accordant with the results which on a former occasion I had the pleasure to bring to your notice in reference to the climate of Bengal, the period from July to November being strongly marked as productive of sickness and mortality. These last observations will not appear irrelevant, when it is considered that similar results of climate naturally point to similarity in preventive measures.

In Upper Canada, it is said in the Report that intermittent fever is comparatively rare, wherever the surface is covered with the dense forests ; even though the ground is wet and marshy. The vicinity of lands recently cleared are most subject to them, particularly meadows, or open patches of the forest, which though denuded of trees, have not been brought under cultivation ; it would appear too, that their prevalence is diminishing with the progress of agricultural improvement ; for since 1831, a period during which this province has been rapidly advancing in wealth and population, and many important changes have taken place in the vicinity of the stations occupied by the troops, intermittents have become comparatively rare, the proportion attacked having been scarcely one-tenth part so high as the average previous to that period. At page 156 of my Notes on the Medical Topography of Calcutta, will be found a very remarkable instance wherein a deadly station in the Island of Tobago had been rendered, by the simple measure of Draining a Marsh, " one of the healthiest quarters in the Windward and Leeward Island Station." The circumstances are stated at length by Dr. Robert Jackson, and the fact of improved health is grounded on " a comparative view of the Sick Returns of the Army."

In the Statistical Reports already referred to, many circumstances are stated in reference to various localities, and their influences, which would lead to converse opinions as to the causes of fever especially ; but in reference to the practical nature of the subject before us, and to the present state of our knowledge as to the causes of disease in general, it may prove more satisfactory to confine myself to the more commonly received opinions of medical men in all countries.

Yours very truly,

J. R. MARTIN.

BARRACKPORE,
August 28th, 1839.

No. 3.

(No. 528)

SIR,

Kidderpore Dockyard, 27th April, 1840.

On the receipt of your letter, dated the 22d February, addressed to Rustomjee Cowasjee, Esquire, who transmitted it to myself, I was desirous of giving you immediately all the information you required ; not having however, the Records of the Tides for the years 1835-36 or 37, I sought for them, and I am sorry to say I have not yet obtained them. I therefore send you now the depths,* &c. for the years 1838-39, and should I subsequently procure the Records of the other years, I shall have much pleasure in sending you fuller information.

Highest high Water during the Freshes.

1838	4 Sept.	22 feet 10 inches.
1839	23 Sept.	23 feet 0 inches.

Highest low Water neap Tides during the Freshes.

1838	13 Sept.	12 feet 8 inches.
1839	17 Sept.	12 feet 4 inches.

Lowest high Water neap Tides, Dry Season.

1838	20 Feb.	9 feet 6 inches.
1839	9 Feb.	9 feet 2 inches.

Lowest low Water spring Tides Dry Season.

1838	26 Feb.	2 feet 1 inch.
1839	18 Feb.	2 feet 2 inches.

Yours faithfully,

ALEX. GORDON,

General Superintendent of Docks.

To J. MORRIS, ESQ.

Municipal Office, Town Hall.

*NOTE—The above has been inserted on the Map marked No. 4 by the late Mr. J. Kyd—vide Appendix (G) opposite page 14.—J. M.

No. 4.

(No. 649.)

To THE HON'BLE. SIR J. P. GRANT.

1. Original letter from Major Taylor to the address of the late Mr. Thomas Hoseason, dated 27th, December 1834.

2. Copy of letter from the Committee appointed for the consideration of certain questions propounded by the Military Board to Captain Gabin Young, Secretary to the Board, dated 11th January 1834.

3. Estimate for Draining the Salt Water Lake by Captain Thomson, Engineers.

4. Original letter from the late Mr. James Prinsep to D. M'Farlan Esq. on the subject of the Silting of the Salt Water Lake.

SIR,

In reply to your reference of yesterday, I have the honor to forward to the Fever Hospital and Municipal Committee the Papers as per margin. The lamented Mr. James Prinsep's autograph to my address is valuable, might I request the return of the Papers when done with—I think they will afford a clue to trace other Documents.

I have the honor to be,

Sir,

Your most obedient servant,

CALCUTTA, POLICE OFFICE,
19th November, 1840.

D. M'FARLAN,
Chief Magistrate.

No. 4. (A)

*Estimate for Draining the Salt Water Lake by Capt. J. Thomson,
Engineers, 1st. January, 1835.*

ORIGINAL ESTIMATE.*							
Embanking, .. .. .	..	..	..	..	..	..	20,000
Draining, .. .. .	..	..	..	..	..	..	32,000
Sluices, .. .. .	..	..	..	..	..	..	82,000
Ditto, .. .. .	..	..	..	..	..	..	14,000
Cuts, .. .. .	..	..	..	..	..	..	12,000
Superintendence, .. .. .	..	..	..	..	..	..	10,000
Interest, .. .. .	..	..	..	..	..	..	30,000
Total							2,00,000
Purchase, .. .. .	..	..	..	..	..	..	3,40,000
							5,40,000
Interest, at 5 per cent. .. .. .	..	..	..	..	..	..	27,000
Repairs, &c. .. .. .	..	..	..	..	..	..	10,000
Annual expense, .. .. .	..	..	..	..	..	..	37,000
INCOME.							
30,000 Beegahs at 2 Rs. .. .. .	..	..	..	..	..	..	60,000
Profit per annum, .. .. .	..	..	..	..	..	..	23,000

*Vide Appendix (G) page 41 where an Estimate, dated 11th July 1834 by Capt. Thomson will be found.—J. M.

NEW ESTIMATE.

Embanking, ..	..	..	..	37,000
Draining ..	.	..	..	9,000
Sluices, ..	..	..	..	17,500
Purchase,				
20,000 B. &c.	..	..	..	56,000
Superintendence,	..	..	..	5,000
Interest, ..	..	..	..	15,000
				<hr/> 1,39,500
Interest at 5 per cent.	..	..	..	7,000
Annual Repair, ..	..	..	..	10,000
				<hr/> INCOME.
				17,000
7000 Bgs. at 2,	..	..	..	14,000
7000 Ditto, at 1,	4,	..	..	8,750
6000 Ditto, at	8 ans.	..	..	3,000
Fisheries, ..	..	..	..	1,500
				<hr/> 27,250
Profit per Annum	..	..	..	10,000

No. 4. (B)

MY DEAR M'FARLAN.

There is nothing impossible in the Silting up of the Lake; and it must only be considered as a question of expense and expediency. The process is going forward *Apse-ap*—and in a mode not quite so rapid as is proposed by the Governor General, but attended with no danger or expense.

The Tarda Nala flood **b*. on entering the Lake spreads over the Lake through the small outlets *a. a. a.* where a deposit naturally takes place—this is increased by the fishermen's basket works and stakes, which retard the water on its return—bunds are soon formed, and vegetation raises the Level until it is fit for habitation and cultivation as *g. h.*—the channel itself being confined, by the bund thus formed on its sides, deepens, and thus a Canal is of itself formed, with dry land on either side, deeper and in a better direction than the proposed expensive cut at *e*. The Sunderbun water is not so clear in the

* Vide Maps opposite pages 38 and 47 of Appendix (G)—J. M.

rains as has been supposed, and is capable of depositing a good deal each tide, though not so much as might be brought through a Feeder cut at *f*.—this Feeder, however, would be a very expensive thing, on account of the Ground to be purchased.

Have the *oldest Records of Government been searched to ascertain how much land was occupied towards Bahminghata, that the progress of deposit upwards may be reduced to calculation?—2nd, was there not a Lake on Tolly's Nala about midway; and has this been filled up by the flooding from the Hooghly? Let these two points be matters of examination before you form your opinion on such a momentous question.

The Estimate of the expense of cutting a Feeder in my brother's Note (printed in the July Gleanings 1830,) is much under the mark.

(Signed) J. P.

* Reference to Captain Claude Martin's Survey in 1760 of the Calcutta Lands or 24-Pergunnahs, which is lodged in the Surveyor General's Office, will throw some light on the above Question.—J. M.

No. 5.

MY DEAR GORDON,

Schalch's Levels of the Town were not (as far as I could understand those in the Lottery Committee's Office) referred to a standard†—when Capt. S. referred to a Gauge it generally was the Koolya Bridge Gauge—the Zero of which was 6 feet 5½ inches of Prinsep's Gauge. I make you a present of some lithograph levels, which are tolerably accurate—you will see there, that there was in September 1823 a tide that did not fall below 11 of Prinsep's Gauge. The average of the highest *Low water marks* is 3 feet, or 5 feet below the lowest part of Calcutta.

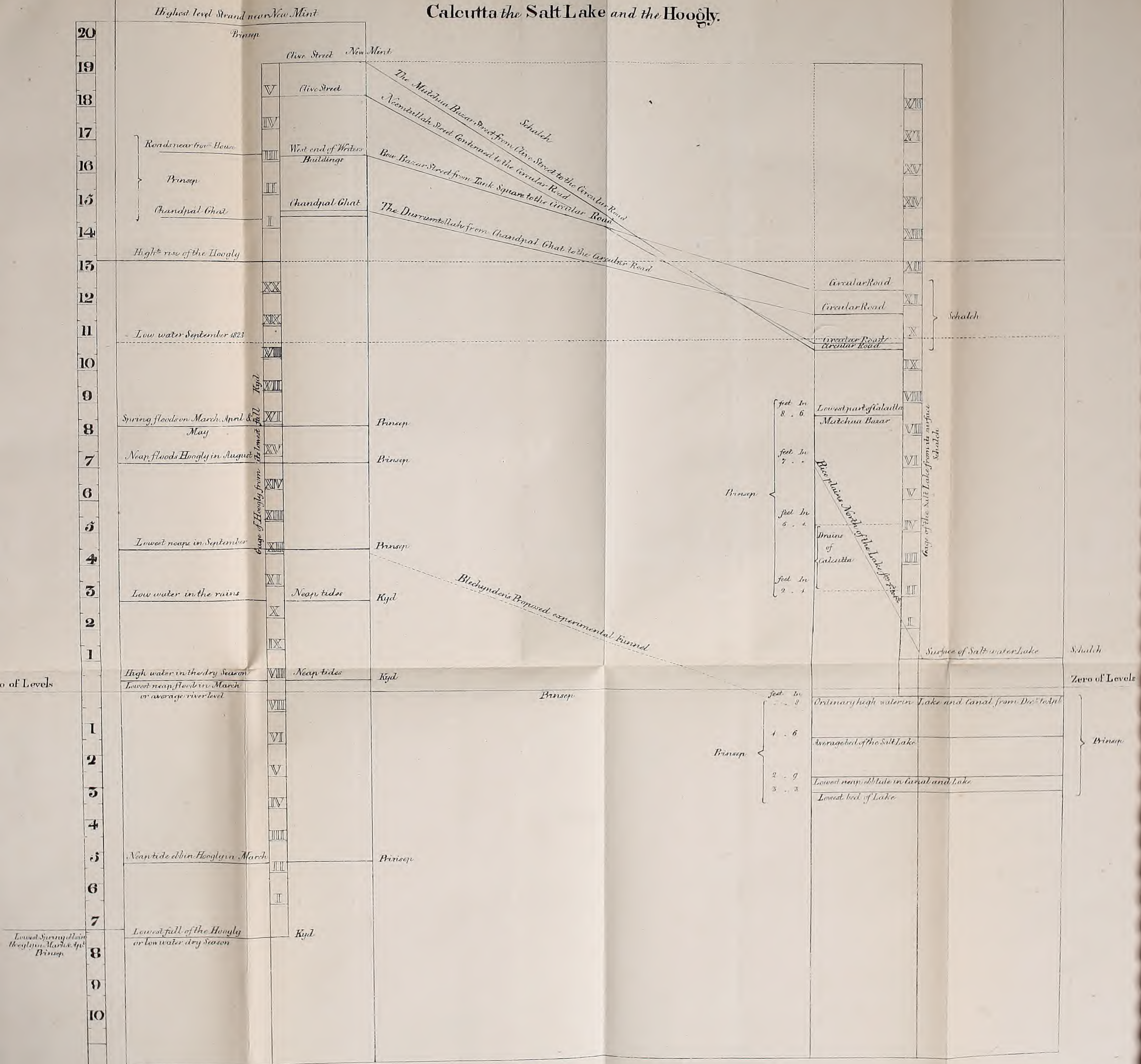
Yours truly,
J. THOMSON.

† NOTE.—Major Schalch reckoned his base line as answering to 11 feet 10 inches, of Kyd's Gauge. Vide Appendix to Appendix (G) page xxv.—J. M.

LEVELS

of

Calcutta *the* Salt Lake *and the* Hooghly.





ROUTES.

No.	Military Board Office.	Title of Maps.	Author's Name.	Original or Copy.	Scale.	Date.	Remarks.
1	140	Sketch of the road from Calcutta to Jessore, }	Captain J. A. Crommelin, ..... }	....	Miles Inch, 4—1	1834	{ In good condition.
2	145	Sketch of the road from Calcutta to Kishnagur, 61 Miles. }	Ditto, ..... }	....	4—1	1834	Ditto.
							CANAL AND RIVER SURVEYS.
							Surveyor General's Office.
1	Vol. IV. M. 5	Map illustrative of the Rivers, Canals, and Water communication of the Lower Provinces of Bengal and Bahar, (unfinished,) }	{ Constructed in the Surveyor General's Office by order of Colonel Colin Mackenzie, Surveyor General of India, .. } }	Compilation,	12—1	....	{ Lat. and Long. Lines drawn. In good order.
2	31	Sketch of the Hooghly River from Calcutta to Kedgerree, }	{ Compiled in the Surveyor General's Office, } }	Red. Copy,	2—1	1830, 17 Mar.	{ Lat. and Long. Lines drawn.
3	Q. 1	A Survey of part of the Soonderbuns, made during the three seasons of 1811-12-13-14, by Lieutenant W.E. Morrieson, oriented or corrected by Astronomical observations, to which is added Captain Hugh Morrieson's continuation of the Soondurhuns' Survey in 1818, .. }	{ Lieutenant W. E. Morrieson, Engineers and Captain Hugh Morrieson, D.A.Q.M.G. .. } }	Copy,	2—1	1811--14 and 1818	{ A large Map in good order. Lat. and Long. Lines drawn. Long. referred to the Meridian of Calcutta, Fort William.
4	6	Survey of the Soonderhuns, in 8 sheets, }	By Capt. T. Robertson,	Copy,	1—1	1803	In good order,
5	11	A Map of the Soonderhuns, extending from the Hooghly to the Megna River, with an enlarged copy of its Eastern Portion, forming a plan of the Islands at the mouth of the Megna River, .. }	{ Anonymous, hut supposed to be surveyed by Rennell, Ritchie, or Martin, between 1760 and 1780, } }	Copy,	5—1 Enlarged Copy, 1875 Br. Miles 1.	1770	{ Lat. and long. lines drawn in pencil, the latter referred to the Meridian of Fort William, enlarged Copy unfinished.
6	18	Surveys of the Salt Lakes and Marshes adjoining Calcuttashewing the connection with the different Canals and Tide Creeks, }	Captain T. Prinsep,	Copy,	½—1	1828, Dec.	In good order.
7	S. 41	Table shewing the High and Low water of the Hooghly at Calcutta in spring and neap tides, .... }	.....	Original and Copy,	....	1806—7	{ In good condition.
8	Vol. III. Comp. III. 56	McCarthy's Survey of Watson's Docks in the Hooghly River, in 2 sheets, unfinishedwithalithographic plan on areduced scale, .. }	.....	Original and Lithographic Copy,	Feet In. 150—1	....	{ In good order, but old.
							* A Lithograph Copy of this Map is inserted opposite page 6 of Appendix G.—J.M.

CANAL AND RIVER SURVEYS.

No.	Surveyor General's Office.	Title of Maps.	Author's Name.	Original Copy. or	Scale.	Date.	Remarks.
9	Vol. 111. Comp. 1V. 4	Lithographic Map of the Rivers Ganges, Bhagrutty & Hooghly, in 8 sheets, from Allahabad to Calcutta, corrected from the old Surveys of Major R. H. Colebrooke, dated 1801, J. S. May and Captain Fitzgerald, exhibiting their present appearance in September and October, 1828,	Capt. Thos. Prinsep, Engineers,	Lithograph,	Miles In. 2—1	October, 1828.	In excellent condition, received 31st July 1829.
10	Vol. 111. Comp. V. 35	Survey of the River and Country on the Western Bank of the Hooghly, from Sangrall Point to Budge-Budge,	Captain Mark Wood, Engineers, .. ..	....	Furlongs In. 1—1	1780—81	In pretty good order. Large Map.
11	35½	A Survey of the West side of the Hooghly River, from the mouth of the Dummodah River to Fort William, ....	....	....	Br. Miles, In. 1½—1	1777,	In pretty good order.
12	36	A Ditto of the East side of the Hooghly River, from Fultha to Chingry Creek, ..	....	....	0½—1	1777,	Ditto.
13	39	Survey of the Rivers Choornee, Howleah, Coomer and Issamutty &c. to ascertain the practicability of opening a new and more direct Passage to the Ganges through Tolly's Nullah and the Soonderbuns,	R. H. Colebrooke, Surveyor General, }	3 Copies, ..	Br. Miles In. 2—1	1795, February, April, and May.	In good order. 1 Copy Pasted on cloth.
14	40	Map of the Survey of the Cossimbazar and Issamutty Rivers and part of the Ganges, }	Major R. H. Colebrooke, }	2 Copies, ..	4—1	1796,	In good order.
15	42	Plan exhibiting the Soonderbun Passage from the mouth of Tolly's Nullah to Hitchindia and Chouragundpore on the Jaboona River, No. 1.	R. H. Colebrooke, Surveyor General, }	Ditto,	1—1	1795,	Ditto.
16	43	Survey of the Issamutty River, Chouragundpore to Noonagunge,	Ditto,	1 Ditto,	1—1	....	Ditto.
17	44	Survey of the Choornee and Issamutty Rivers, the Jaboona Creek and part of the Hooghly River, ....	....	....	1—1	....	Torn or rather destroyed near the title by cockroaches.
18	45	Survey of the Choornee and part of the Issamutty Rivers from Hurrerapoor to Taldahy, ....	....	....	0½—1	1810,	Nearly the whole of this plan is contained in the preceding Map, No. 44.
19	46	A Survey of Soonderhun Passage from Balliaghaut on the Salt Lake to Sutaloor, ..	....	....	....	....	In good order.
20	47	Map of the Kachecatta and and Koomar Rivers, ....	....	....	1—1	1810,	Ditto.
21	48	An accurate Plan of the River Hooghly from Kidderpore or Tolly's Nullah to Chitpoor, with soundings, }	J. McCarthy, }	Original,	Fur feet, In. ½ or 330—1	....	In good order.
22	49	Survey of Tolly's Canal, in 2 sheets,	Lieutenant T. T. Blunt, Engineers, }	Ditto,	Yds. 200—1	....	Ditto

CANAL AND RIVER SURVEYS.

No.	Surveyor General's Office.	Title of Maps.	Author's Name.	Original or Copy.	Scale.	Date.	Remarks.
23	50	Plan of the Jaboona Creek } (between the Issamutty and } Hooghly Rivers,) .... }	....	....	Br. Miles, In. 2—1	....	Ditto.
..	73	Map of the Ishamati River } between Pabna on the Gan- } ges and Harrisagar, .. }	Captain Richard } Wilcox B. N. I. .. }	Copy.	1—1	1830-31	Ditto.
	Chief Engineer's Office.						
24	32	A plan of Diamond Har- } bour, shewing the disposi- } tion of the Moorings together } with the buildings erected } for the accommodation of } the Officers and crews of the } Hon'ble E. I. Company's } Europe ships, }	James Caldwell, } Lieutenant of En- } gineers, .... }	....	Feet In. 50—1	January, 1789,	In good condi- tion, ex- cept injured by worms a little at one end.
25	77	An old torn Survey of the } River Hooghly with the sev- } eral settlements without } names, .... }	....	....	Mile Inches. 1—2 $\frac{7}{10}$	....	Much torn, and in bad condition.
26	132	Survey of Tolly's Nullah, } commencing from the } Hooghly River S. W. of } Fort William to the Salt Go- } lah near Tengurryah, with } 15 Sections, shewing the } breadth and depth of the } Nullah at different places, } also the rise of the water at } neap and spring tides in } June, 1796, .... }	....	....	....	....	In good condi- tion.
27	176	Survey of the Salt Lakes } or Marshes adjoining Cal- } cutta, shewing the connec- } tion with the different Can- } als and Tide Creeks, copi- } ied from the original, by } T. Prinsep, Captain, En- } gineers, 1828, also exhibit- } ing the method of settling } the Lake by compartments } proposed by the Chief Engi- } neer, }	Colonel Sir Thos. } Anbury, K. C. B. .. }	....	Fur.—In. 1— $\frac{1}{4}$	Nov. 1833.	Ditto.—See Appendix G opposite p. 6, where a Co- py of this Map is in- serted. J. M.
28	177	Sections of Levels to ac- } company the Chief Engi- } neer's Memoir on the sub- } ject of draining the Salt } Water Lakes, .. .. }	....	....	Feet—In. 100—1	....	Ditto.—See App. G op- posite p. 36, where a Co- py of this Map is in- serted. J. M.
29	178	Another ditto ditto, ..	....	....	....	....	Ditto, ditto.
30	179	Plan of the Salt Water } Lakes near Calcutta, }	Copied from } the Original by } J. Thomson, } Captain, Engi- } neers, Superin- } tendent of Can- } als, .... }	....	M.—In. 1—3 $\frac{1}{4}$	....	Ditto.—See App. G op- posite p. 38, where a Co- py of this Map is in- serted. J. M.
31	181	Survey of Tolly's and Pu- } toory Nullahs, from the } mouth of the former to Ka- } mapookrea on the latter, .. }	T. W. Taylor, } ditto, ditto, ditto, .. }	....	400—1	January, 1827.	In good condi- tion.

CANAL AND RIVER SURVEYS.

No.	Military Board. Office	Title of Maps.	Author's Name.	Original or Copy.	Scale.	Date.	Remarks.
32	....	Map explanatory of a plan for opening a communica- tion between Calcutta, Dia- mond Harbour and the New Anchorage, by means of a Canal proposed to be cut from the Puttoory Nullah to the Bhortullah Khall, ..	Capt. T.M. Taylor,	Copy,	Feet Inch. 1—1	1824.	In good con- dition. — Or- dered to be executed, see para. 87 to 91 of a Des- patch from the Hon'ble. Court of Di- rectors dated 11 July 1827. J. M.
33	....	Surveys of Tolly's and the Puttoory Nullahs,	Ditto,	Original,	600—1	Ditto.	
34	....	Survey with Sections of the Creek between Diamond Harbour and Oastee, ..	Ditto,	Ditto,	Ditto ditto,	Ditto.	
35	....	Surveys of Tolly's and the Puttoory Nullahs from the mouth of the former to Kha- mapookreea,	Ditto,	Ditto,	700—1	Ditto.	
36	....	Survey of the Chingry Creek,	Ditto,	Ditto,	600—1	Ditto.	Ditto.
37	....	Survey of the Eastern Bank of the River Hooghly, from the Chingry Creek to Rangafulla,	Ditto,	Ditto,	1200—1	Ditto.	Ditto.
38	....	Map of the proposed new Navigation from Koolna to Calcutta, shewing the plan of the Canals and the pre- sent passage of the Soonder- buns,	Captain Schalch,	Ditto,	Mile. Inch. 1—1	1821.	Ditto.—See Appendix to Appendix G opposite p. vi, where a Copy of this Map is in- serted. J. M.
39	....	Maps of such parts of the Rivers Gurroy, Komar, Bar- rasee and Moodoomutee, as form the Navigation be- tween the Ganges and the Soonderbund passage, toge- ther with Uttaree Banka & Mowdew Nullahs,	Captain Schalch, ..	Original, ..	2—1	1821	
40	16	Survey of the Hoseenabad and Ballygunge Canal,	Lieutenant Thomas Prinsep,	Ditto.	Fur. Inch. 1—1	....	Ditto.
41	24	Survey along the course of the Bungur Khall,	Ditto,	Ditto.	Mile, Inch. 1—1	....	Ditto.
42	25	Survey of the Eastern Ca- nal exhibiting the various properties which adjoin the Road on its Banks.	Captain Prinsep, } and drawn by Mr. } Turner,	Ditto,	Feet Inch. 125—1	1827	Ditto.
43	26	Sketch of the Chultabar- rya Tide Canal,	Captain Prinsep, ..	Ditto.	100—1	....	Ditto.
44	28	Survey of the Line of country between Chultabar- rya Canal and Bhamunghat- ta, with the proposed New Canal, .. ..	....	Ditto.	Mile, Inch. 1—1	....	Ditto.
45	29	Survey of the course clear- ed in 1827, for the excava- tion of the Canal at Bhowa- nypore, uniting the Hoseina- bad Cuts and Gobra Khall, with the Hinshee Khall, ..	....	Ditto.	Feet Inch. 1400—1	....	Ditto.

CANAL AND RIVER SURVEYS.

No.	Military Board Office.	Title of Maps.	Author's Name.	Original or Copy.	Scale.	Date.	Remarks.
46	31	Plan and Section of the Line of Canal between Chultabarrya and Bhamunghatta, as excavated in 1827-28, ....	....	Original, ..	Mile Inch. 1—4	....	....
47	38	Outline Plan of the Series of Canals between the Hooghly and Issamutty Rivers, ....	....	Ditto.	1—2	1829	In good condition.—See Appendix G opposite p.6, where a reduced Copy of this Map is annexed to Capt. Prinsep's Map of the Suburbs of Calcutta. J. M.
48	39	Sketch of the Bhamunghatta Canal, as executed in 1828-29, ....	....	Ditto.	1—6	1829	
	Superintending Engineer's, Lower Provinces, Office.						
49	14	Survey of the Beel Bulie, a large Jheel in the District of Jessore,	Captain Crommelin, Engineers,	Ditto.	1—1	1834 March.	....
	Secretary to Government Revenue Department.						
50	2	Survey of the Issamutty and Howleah Rivers,	By Lieutenant R. Wroughton, ....	....	1—2	....	When commenced on and finished, not known.
	Secretary to Government, General Dept. Office.						
51	11	A ms. Sketch of the large Dock at Howrah built.	By the late Mr. Jones [by Sepping]	....	Feet Inch. 8—1	....	In good order.
52	3	Levels carried from the Bank of the Hooghly River in different parts of the Town of Calcutta towards the Mahratta Ditch and Salt Water Lake, ....	....	....	....	1783-84,	Lent to the Marine Board, and said to be lost.—J. M.
53	12	Map of Jabuna Creek, ....	....	....	Br. Miles In. 1—1½	1820.	In good order.
54	23	Survey of the Cossimbazar River and part of the Ganges,	By R. H. Colebrooke, Surveyor General, ....	....	1—1	1796,	Rotten, torn.
55	36	Survey of the River Choornee, Howleah, Coomar and Issamutty,	By R. H. Colebrooke, Surveyor General, ..	....	2—1	1795,	In good order.

CANAL AND RIVER SURVEYS.

No.	Secretary to Govt. General Dept. Office late Chief Se- cretary's Office.	Title of Maps.	Author's Name.	Original or Copy.	Scale.	Date.	Remarks.
56	43	Survey of the Issamutty River, &c.	{ By R. H. Cole- brooke, Surveyor } General, .... }	....	1—1	....	In good order.
57	44	Survey of the bank and soundings of the River from Calcutta to the Boundary Esplanade,	{ By Ensign John } Gordon, .... }	....	....	....	{ In pretty good order.
58	51	Survey of the Choornee or Hurdum River, }	By R. H. Colebrooke,	....	....	....	Ditto.
59	84	Survey of the Bank and soundings of the River from Calcutta to the Boundary of the Esplanade, }	{ By Captain F. H. } Pearson, .... }	....	....	....	....
		Office of Board of Customs Salt and Opium &c. Marine Board.					
60	28	A Sketch of the Inland Na- vigation of Lacam's Channel, or rather a portion of the In- land Navigation from the head of Channel Creek, }	Not mentioned,	....	....	None,	....
61	B. 5	Charts of, and Remarks on, the River Hooghly, }	P. G. Sinclair,	Original,	Miles, In. 1—2	1827,	{ A Book of little value.
62	6	Plan of the Hooghly Ri- ver from Kidderpore to Chit- pore House, }	J. McCarthy,	Ditto,	Ft. In. 300—1	No date,	Manuscript.
63	7	A Plan of Calcutta Reach,	Lloyd,	Ditto,	300—1½	1835,	....
64	10	Plan of the Eastern bank and Channel of the River from Old Fort Ghaut to Ab- bott's Wall, }	Not mentioned, ..	Ditto,	100—2½	1797,	{ These two Charts are connected with each other, and together show how far the bank within its Boundaries has en- croached up- on the River.
65	11	Views of the Shelving of the bank taken at four places between Old Fort Ghaut and Abbott's Wall, }	Not stated,	Original,	10—1	1797,	
66	24	Chart of Saugor Island comprehending Channel Creek from Edmonstone's Island to Frederick Point, the Eastern and Thornhill Channels, }	{ Marine Surveyor } and Assistants, }	Ditto,	Mile Inch, 1—1½	1816—17,	....
67	7	Sketch of Lacam's and the Eastern Channels, }	R. Lloyd, J. N.	Ditto,	10—Long 4½	1837,	Lithograph,
68	8	Draft of Lacam's Channel,	Mr. Sinclair, B. P.	Ditto,	None,	1827,	Ditto.
69	9	Survey of Lacam's Chan- nel to the Lower part of Earl Moira's Harbour, .. }	Maxfield,	Ditto,	....	None,	....
70	11	Plan of Thornhill's Channel,	{ Under direction } of the Master At- tendant, }	Ditto,	....	1807,	....

MAPS, PLANS, AND LAND SURVEYS.

No.	Surveyor General's Office.	Title of Maps.	Author's Name.	Original or Copy.	Scale.	Date.	Remarks.
1	Vol. IV. A 24	Captain Fleming's Survey } in the Vicinity of Calcutta. }	Captain Fleming.	Original Copy and Reduction.	Br. Ml. Inch, Red. $\frac{1}{2}$ } —1	1801.	{ With rough Drafts on half foolscap sheets.
2	26	Calcutta Lands or 24-Pergunnahs. }	Captain Claude Martin. }	Original and 2 old Copies and 1 new Ditto.	M. 1—1	about 1760.	{ Original, pasted on cloth, completely destroyed by age.
3	M 4	Part of the General Survey of the Calcutta Lands (or 24-Pergunnahs.) }	Captain Claude Martin. }	Original and 2 fair Copies.	1—1	about 1760.	{ The Original is in bad condition, Paper having become rotten. A Meridian Line is given.
4	9	Plan of the Company's Lands and Lakes. }	By Captain Cameron. }	Copy.	About $1\frac{1}{2}$ —1	....	{ A Meridian Line given.
5	12	Map of the Country from 30 to 40 Miles round Calcutta, compiled from Materials in the Surveyor General's Office, for the use of the Superintendent of Police. }	By R. H. Colebrooke, Surveyor General. }	Copy and Reduction.	Copy 2 Red. 4—1	1800.	{ In good order Lat. and Long. Lines drawn.
6	25	Topographical Sketch of the Jessore District. }	{ Compiled in the Surveyor General's Office, 18th January, 1826... }	Copy.	4—1	1826, 18th January.	{ Lat. and Long. Lines drawn.
7	30	Geographical Sketch of the District of Hooghly. }	{ Compiled in the Surveyor General's Office. }	Original compilation and 3 Copies.	4—1	1824, October.	{ Lat. and Long. Lines drawn.
8	32	Sketch Map, or Chart, exhibiting in detail the Tract of Country Surveyed under the Bengal Presidency. }	Ditto.	Compilation.	64—1	1831, 31st December.	{ Graduated for Lat. and Long.
9	35	Plan of the Tract of Country comprehended between the Issamutty River on the East, and the Towns of Bungon, Hobra, and Bagundee to the North West and South, and situated in the Districts of Nuddeea and Barraset, shewing the Indigo Factories. }	No name; Copied in the Surveyor General's Office from the Original Plan, returned to Mr. J. Thomson, Deputy Secretary to Government Revenue and Judicial Department. }	Copy.	$1\frac{1}{2}$ —1	Copied 9th May, 1832.	{ In good order. No Meridian Line given.
10	40	Map of the Provinces of Kishenagur, Jessore, Boosnah, and Mohmudshi, with part of Dacca and Raushyeh, comprehending the habitable part of the Tract of Country situated between the arms of the Ganges. . . }	Surveyed by Rennell, Martin, and Richards. }	2 Copies.	5—1	1764 to 1772.	{ One Copy, pasted on cloth, and very old, the other in better order, not on cloth.
11	43	Map of the Country situated between the arms of the Ganges, comprising the districts of Nuddeea, Jessore, Backergunge, part of Jelapoor, and of the 24-Pergunnahs, including the Joint Magistracy of Barraset. }	{ Compiled in the Office of the Surveyor General of India, from the Maps by Rennell, Martin and Richards, dated 1764-73. The Boundaries of the Districts taken from a Map of the Police Thanahs in the Lower Provinces, dated 1824. }	Compilation Original.	5—1	1836, 19th April, Calcutta.	{ Lat. and Long. Lines drawn.

MAPS, PLANS, AND LAND SURVEYS.

No.	Surveyor General's Office.	Title of Maps.	Author's Name.	Original or Copy.	Scale.	Date.	Remarks.
12	S. 1	A Map of the Suburbs of Calcutta between Barnagore, the Salt Water Lake and Garden Reach, laid down from four Sketches, furnished by Captain F. S. White, Surveyor, with additions and corrections. ..	By Lieut. R. C. Faithfull, Surveyor, Suburbs of Calcutta. }	....	Yards, Inch. 300—1	1817, 11th; November.	{ In good order. A larger Map.
13	2	Map of Casseepore, Barnagore, Paulparrah, Nounparrah, Dunnyraut, Nynun, Seetee Ooturparrah, and part of Bun-Hooghly, Joy-pore Beerparrah, Chitpore, and Pauckparrah, shewing all the Roads, Laues, Tanks Ditches, Houses, and Huts, also Police and Custom Thannahs. ..	Laid down from actual Survey, by Major H. Faithfull and Captain R. C. Faithfull. }	Copy.	100—1	1818, 18th December.	{ Pasted on cloth and edged with black ribbon. It was in very bad condition and half destroyed; in this state it was found by Mr. James Prinsep, Assay Master, Mint, and sent by him for deposit into this Office.
14	4	Survey of part of the Suburbs of Calcutta, commencing at Intally, taken in May and June 1813. }	By J. F. Hyde, Licutenant and Surveyor. }	Fair Ditto.	Feet, Inch. 90—1	1813, May and June.	In good order.
15	5	Plan of Budge-Budge and the River Hooghly in 2 sheets. }	By Lieut. Parrott. }	Apparently Original.	400—1	1772.	{ In tolerable condition but paper decaying.
16	S. 7	Pencil Sketch of the Suburbs of Calcutta, (Ballygunge to Garden Reach.) }	....	....	....	....	{ A middling size Plan.
17	8	Map of Calcutta and its Environs, from an accurate Survey taken in the years 1792, and 1793. }	A. Upjohn. }	Engraved Copy.	Fur. Inch. 1—1	1792-93.	{ Pasted on cloth, in pretty good order.
18	10	Pencil Plan of Garden Reach. .... }	....	....	Feet, Inch. 300—1	....	{ In good condition.
19	12	Survey of the ground to the Southward of Chowringhee and the General Hospital, including the whole of Bhananipoor. }	Ensign Blunt, Engineers. }	Original.	200—1	1796, Nov. and Dec.	{ A Meridian Line drawn, in tolerable order.
20	14	Plan of the Hon'ble. Company's Botanic Garden. }	W. Scott, Assistant Surveyor. }	Copy.	200—1	1819.	In good order.
21	15	A Sketch of the Roads in the Suburbs of Calcutta from Garden Reach to Chitpore, in 4 sheets. }	Lieutenant F. S. White, Surveyor. }	Original.	Mile, Inch. 1—6	1815, Jan.	{ Ditto ditto. Vide S.I. Reg. No. 54.
22	20	Topographical Survey of Calcutta, (unfinished.) }	By the Surveying Apprentices, under the orders of Major Hodgson, Surveyor General of India. }	Ditto.	....	1822.	In good order.
23	38	Plan and the Survey of the Country between Budge-Budge and the Hooghly River, with an unfinished Plan of Survey of the Country South of Allypore and Kidderpore 2 sheets A. & B. }	Lieut. E. Robinson, Engineers. }	Copy.	F. Inch. Plan 1—1 Unt. do. 2—1	1780.	{ In good order sheets S. 38(a) is a continuation of and joins to Map S. 2½, Vide Reg. No. 56.
24	46	Tables of Calcutta Levels, with an unfinished Plan of a Survey of a piece of ground and also a Plan of some Salt Lands. .... }	....	....	....	....	In good order.

MAPS, PLANS, AND LAND SURVEYS.

No.	Chief Engineer's Office.	Title of Maps.	Author's Name.	Original or Copy.	Scale.	Date.	Remarks.
25	13	Plan of Fort William and the City of Calcutta, with the Country round it, laid down from a variety of Surveys in 1786.	T. Call, Chief Engineer.	Ditto.	1—2	1786.	
26	62	An old Survey of Calcutta...	....	Ditto.			
27	63	Part of the General Survey of the Calcutta Lands. ....	....	Ditto.	Mile, Inch. 1—1		
28	131	Plan of the Honorable Company's Botanic Garden, situated on the North bank of the Hooghly River, 4 Miles West of Calcutta, containing an area of 13,40,388, Square Feet or 307 Acres, 2 Roods, 33 Poles 138 Square Feet or 930 Beggahs, 16 Cottahs, 302 Square Feet, laid down from an actual Survey in Jan. 1819. ....	....	Ditto.	Feet, Inch. 200—1	January, 1819.	
29	140	Sketch of the Country between Oolabareah and Panchkowry Ghaut, with a proposed line for the new Road and Canal. ....	....	Ditto.			
30	142	Sketch of the Road across the Budge-Budge Nullah, and a Plan and Section of the new Drain. ....	....	Ditto.			
31	143	Survey of the country between Budge-Budge and Adjepore, shewing the general direction of the continuation of the Budge-Budge Road to Adjepore. ....	....	Ditto.	Feet, Inch. 1200—1		
32	151	Survey of the new line of Road from Budge-Budge to Paunchkoorah Ghaut.	W. R. Fitzgerald, Engineers.	Copy.	Fur. Inch. 8—1	1829.	In good order.
33	208	Plan of the new Grounds at Deegla, lately taken into the Cantonments at Dum-Dum, Exhibiting the site for the new Stables, the low Ground requiring to be levelled and dressed, also the Tanks, Jeels, &c. to be filled up. .. ....	....	Original.	100—1 $\frac{1}{10}$	....	Rough Plan.
34	214	Plan of the Boundaries of Dum-Dum, Copied from a Plan in the Military Board's Office from a Survey by. ..	Lieut. Malloch, Engineers.	Original.	Yards, Inch. 100—6 $\frac{3}{10}$	August 1833.	Rough Plan.
35	225	Plan of the Cantonments at Ballygunge.	W. M. Smyth, Lieut. Engineers...	Ditto.	100—1	April, 1833.	
36	226	Plan of the Cantonments at Allypore.	Ditto, ditto.	Ditto.	100—1 $\frac{2}{10}$	....	Ditto.
37	284	A Sketch of Saugor and its Environs from recollection.	G. Wilton, Ensign, Engineers. ..	Copy.	Mile, Inch. 1—2	....	In good condition.
	Military Board Office.						
38	....	Survey of the Road, Ditch and Nullah, between Oostee and Hottogunge.	Captain T.M. Taylor.	Original.	Feet, Inch. 600—1	1836, July.	In good condition.

MAPS, PLANS, AND LAND SURVEYS.

No.	Military Board Office.	Title of Maps.	Author's Name.	Original or Copy.	Scale.	Date.	Remarks.
39	....	Survey and Levelling section of the Country between Kamapookreeah and Oostee. }	Ditto.	Ditto.	1200—1	Ditto.	Ditto.
40	....	Survey and Levelling section along the ridge of ground which crosses the line of the Diamond Harbour Canal at Gourypore... }	Ditto.	Ditto.	Do. Do.	Ditto.	Ditto.
41	4	Map of the City of Calcutta, with part of the Suburbs and adjacent Country lying to the Eastward. }	Captain Schalch.	Ditto.	Fur. Inch. 2½—1	1821.	Ditto.
	Quarter Master General's Office.						
42	115	Map of Calcutta. ....	....	Copy.	Mile. Inch. 1—3½	....	Good.
43	44	Plan of Davidson's Survey of Dum-Dum and Cossipore. }	Thomas Hardwick.	Copy.	5—1	1815.	Indifferent.
44	188	Plan of the School ground at Kidderpore. .. .. }	....	Original.	Fect. Inch. 100—1	1817.	Ditto.
	Superintending Engineer lower Provinces Office.						
45	8	Survey of the Bunds between Diamond Harbour and Calcutta. }	{ Mr. Rowe Assistant to Captain Fitzgerald, Engineers. }	Copy.	Feet, Inch. 2000—1		
46	11	Survey of the Embankments in the 24-Pergunnahs. }	Ditto. ....	....	1—1		
47	29	Plan of the Cantonments and Park at Barrackpore. }	{ Ensign Kewney, Deputy Assistant Quarter Master General. }	Copy.	250—1	1835, June.	
48	20	Plan of the Artillery Cantonments at Dum-Dum..... }	Ditto, ditto.	Ditto.	250—1	1835, 1st Sept.	
	Secretary to Government Bengal Judicial Department.						
49	3	Map of Jungle Mehals.	Unknown.	Copy.	Mile, Inch. 5—1		
50	4	Map of Jessore.	Ditto.	Ditto.	Ditto.		
49	5	Map of Nuddeah.	Ditto.	Ditto.			
50	22	A Sketch of the Districts of Nuddeah, Jessore, and the 24-Pergunnahs. }	Ditto.	Ditto.	10—1		
51	34	Sketch of Jessore, Soonderbuns, and the 24-Pergunnahs. }	Ditto.	Ditto.	2—1	1817.	

MAPS, PLANS, AND LAND SURVEYS.

No.	Secretary to Government Bengal, Judicial Department.	Title of Maps.	Author's Name.	Original or Copy.	Scale.	Date.	Remarks.
52	57	Map of the Soonderbuns, compiled from the latest Government Documents, and shewing accurately the Boundaries of the Forest, the recent Grants of Land and those of 1780, together with 128 additional allotments of Jungle Land, also a Skeleton Map of the Country adjacent to the Soonderbuns, and comprising the 24 Pergunnahs with Calcutta and its Environs, and part of the Kishnagur, Jessore, and Backergunge Districts.	By Lieutenant A. Hodges, 29th Regiment Bengal Native Infantry, and W. Dampier, Esquire. ....	....	Mile, Inch. 2—1	1831.	Printed and published by permission by T. Black, at the Asiatic Lithographic Press, Calcutta.
53	63	Survey of part of the Soonderbuns.	By Lieutenant W. C. Morrieson. ....	....	4—1	1811-12-13-14.	
54	65	A Survey of Military Cantonments at Ballygunge.	By J. Gordon, Lieut. Engineers. ....	....	Yards, Inch. 100—1		
	Secretary to Government Bengal, Revenue Department.						
55	9	Plan of the Northern part of Saugor Island, extending to the new Anchorage. ....	....	Copy.	1—2	....	Copied from Lieut. Blane's Survey received with Sudder Board's letter, 23rd March 1830.
56	15	Map of Saugor Island.	{ By Mr. Harris, } H. C. M. ....	....	2—1	....	{ Received with Sudder Board's letter 23rd Mar. 1830.
57	25	Map of Kidderpore.	Unknown. ....	....	100—1		
58	26	Survey of parts of the Suburbs of Calcutta, commencing at Entally.	By Lieut. J. F. Hyde. ....	....	100—1	May and June, 1813.	In 3 Sheets.
59	34	Sketch exhibiting the Eastern Salt Chowkies.	Unknown. ....	....	Mile, Inch. 8—1		
60	38	Map of the Soonderbuns and the Environs of Calcutta, comprising the 24 Pergunnahs and Hooghly District, with part of Jessore and Nuddeah.	By Capt. T. Prinsep.	....	4—1	1830.	Lithographed. See Appendix G. to Municipal Committee's Report opposite page 6, where a Copy of this Map is annexed.—J. M.
61	42	Plan of the City and Environs of Calcutta.	Constructed chiefly from Major Schalch's and Captain Prinsep's Surveys of the Suburbs, with the latest Improvements. ....	....	2½—1	....	{ Drawn and Lithographed by J. B. Tassin, 1832.

MAPS, PLANS, AND LAND SURVEYS.

No.	Secretary to Government, General Department's Office.	Title of Maps.	Author's Name.	Original or Copy.	Scale.	Date.	Remarks.
62	31	The Suburbs of Calcutta, in 6 parts, 1 Map.	By Capt. T. Prinsep.	....	Mile, Inch. 4—1	1830.	In pretty good order.—See Appendix. G. to Municipal Committee's Report opposite p. 6 where a Copy of this Map is annexed.—J. M.
63	58	Sketch of the vacant ground in Cornwallis-Square.	{ By Burn and Co. } { on Reverend J. C. } { Illes' reference. }	....	Feet, Inch. 30—1	....	In good order.
64	60	A Plan of Tank-Square and the Public Library.....	....	....	100—1	....	Ditto.
65	61	Plan of Mr. D. Hare's property and the Bankshall premises. ....	....	....	30—1	....	{ Rough and injured.
66	83	A Map of the City and Environs of Calcutta.	By J. B. Tassin.	....	700—1	....	{ Framed and glazed, in good order.
Secretary to Government, General Department's late Chief Secretary's Office.							
67	5	Sketch of ground purchased from the Nabob of Moorshedabad.	By Lieut. C. Paton.	....	Feet, Inch. 35—1	....	Old and damaged.
68	6	Section of the Bank at the Old Fort Ghaut.	By Capt. Pearson.				
69	14	Table of Levels for the Town of Calcutta, taken by order of the Marquis Wellesley, K. P. Governor General and Captain General, &c. &c. in the year 1804-5.	{ By James Robert- } { son, Lieutenant, } { Engineers. .. }	....	....	1804-5	{ See App. I. to Municipal Committee's Report opposite page — where a Copy of this Map is annexed. J. M.
70	18	Plan of the Great Circular Road. ....	....	....	....	....	{ In several sheets, a little moth-eaten.
71	19	A proposed Scheme for sub-dividing the Grounds bounded by the Calcutta great Streets. ....	....	....	200—1	....	{ Very old and torn. Pertaining to the Paper printed in the Addenda to Appendix. F. to Municipal Committee's Report, See page 308, paragraph 7.
72	38	Plan of part of the Burrah Bazar.	H. Osborn. ..	....	70—1	1819.	In good order.
73	40	Rough Sketch of the Town of Calcutta.	By Capt. Collins.	....	20—1	....	{ In pretty good order.
74	46	Plan of Calcutta Roads, &c. &c. ....	....	....	....	....	{ In several rolls, in pretty good order.
75	79	Map of Calcutta and its Environs, from an accurate Survey.	A. Upjohn.	3 Copies.	....	1792-93.	In good order.
76	91	Rough Plan of the Ground round the Government House. ..	{ By Captain Wyatt, } { Engineers. .. }	....	30—1	....	{ Torn, and in bad condition.

MAPS, PLANS, AND LAND SURVEYS.

No.	Secretary to Government, Political Department.	Title of Maps.	Author's Name.	Original or Copy.	Scale.	Date.	Remarks.
77	115	A rough Sketch of the Chowringhee Roads, &c. ..	....	....	Feet, Inch. 140—1	....	{ Torn and injured.
78	116	A Plan of different Buildings and Houses at Bow Bazar and other adjacent Streets.	General Garstin. ..	....	70—1	1813.	{ Mounted on cloth, and in pretty good order.
79	120	A Sketch of Chitpore Road, &c.	Lieutenant Paton.	....	....	1820.	{ In pretty good order.
80	119	Map of Calcutta.	Major Schalch. ....	....	....	1820.	
81	..	Koolna and Calcutta.					
82	..	Map of the Soonderbuns. ....	....	....	Mile, Inch. $\frac{1}{2}$ —1	1833-34-35.	
Magistrate's Office, 24-Pergunnahs.							
83	1	Calcutta and its Environs...	{ J. A. Schalch, Major, Superintendent of Canals and Bridges. .. }	Original. ..	....	1825.	In good order
84	3	Map of the Country, from 30 to 40 miles round Calcutta, including the Company's Lands or the 24-Pergunnahs.	{ Asiatic Lithographic Company's Press. }	Copy. ..	....	....	In bad order.
85	5	Map of the 7 Southern Thannas of the 24-Pergunnahs.	{ Abdool Rubine, Draftsman. }	Ditto. ..	....	...	Ditto.
86	7	Dum-Dum Cantonments.	{ Lieut. Mallock, Engineers. }	Ditto. ..	1900 Yards.	August 1833.	Ditto.
District 24-Pergunnahs, Civil Judge's Court.							
87	1	Map of 24-Pergunnahs, 30 to 40 miles round Calcutta.	No name.	Not known, but it is in Manuscript	2 Geographic miles to 1 Inch.	1800.	{ In bad order, almost destroyed.
Commissioner's Office Soonderbuns.							
88	11	Map of the Dum-Dum Cantonments.	{ Ensign Buxton, Engineers. }	Original. ..	1 Mile to 1 Foot.	1816.	{ This Map is in a middling condition.
89	13	Map of the Soonderbuns adjoining the Districts of the 24-Pergunnahs and Kissen-nuggur.	Lieutenant Hodges.	Lithographed Copy	Ditto to $\frac{1}{2}$ In.	1831.	{ This is in good state.
90	17	Map of the Soonderbuns adjoining the District of Jessore.	Ditto.	Ditto.	Ditto.	Ditto.	{ This Map is in a good state.
91	33	Map of the Soonderbuns adjoining the District of Backergunge.	Ditto.	Ditto.	Ditto.	Ditto.	{ These three Maps are in a good condition.
92	36	Map of the Soonderbuns adjoining the District of Backergunge.	Lieutenant Hodges.	Lithographed Copy	1 Mile to $\frac{1}{2}$ Inch.	1831.	{ This Map is in a good condition.
93	47	No. 1. Survey of the Soonderbuns boundary line continued from Pranpore..	Ditto.	Ditto.	Ditto to 4 In.	1829.	{ This is in good state.

MAPS, PLANS, AND LAND SURVEYS.

No.	Commissioner's Office Soonderbuns.	Title of Maps.	Author's Name.	Original or Copy.	Scale.	Date.	Remarks.
94	60	No. 8. Survey of the Soonderbuns boundary line continued from Pranpore..	Lieutenant Hodges	Lithographed Copy.	1 Mile to 4 Inch.	1829.	{ This is in good state.
95	61	No. 9. Survey of the Soonderbuns boundary line continued from Pranpore..	Ditto.	Ditto.	Ditto.	Ditto.	{ This Map is in a good state.
96	72	No. 1. Abstract of the boundary of the Soonderbunds, comprising No. 1, 2, and 3.	Ditto.	Ditto.	1 Mile to 1 Inch.	Ditto.	Ditto.
97	129	Map of the Soonderbuns adjoining the District of 24-Pergunnahs and Kissennuggor.	Ditto.	Ditto.	1 Mile to 1/2 Inch.	1831.	{ This Map is in a good state.
98	130	No. 13. Survey of the Soonderbun's boundary line continued from Pranpore.	Ditto.	Ditto.	1 Mile to 4 Inch.	1830.	Ditto. ditto.
99	131	No. 1. Abstract of the boundary of the Soonderbuns, comprising Nos. 1, 2, and 3.	Ditto.	Ditto.	1 Mile to 1 Inch.	1829.	Ditto. ditto.
100	....	N. B. Besides the above, there are nine Field Books relative to Captain Prinssep's Survey of the Soonderbuns and of the Puteet Abadee Estates in the 24-Pergunnahs, four of Capt. Hodges of the Soonderbuns boundary Line, and two volumes of Areas and Offsets.					
	Zillah Nuddeah, Judge's Office.						
101	2	Map of part of the Soonderbuns.	John Garstin, Surveyor General. ..	Copy.	Not mentioned.	22nd Dec. 1810.	{ In pretty good condition.
	24-Pergunnahs Collector's Cutcherry.						
102	1	Map of the Country from 30 to 40 Miles from Calcutta including the Company's Land or the 24-Pergunnahs.	No name.	Copy. ...	No Scale.	No date.	{ This Map has been recently purchased for the use of this office.
103	3	Ditto Khasellehal Bura-nuggur.	John Kelso.	Ditto.	Ditto.	1828.	{ In good condition.
104	4	Plan of the Artillery Ground at Dum-Dum.	Lieutenant J. Gordon.	Ditto.	Ditto.	1823.	{ Tolerable condition.
	Residency Special Commission Calcutta and Moorshedabad Division.						
105	....	Portion of the Soonderbuns.	J. H. Madge.	Original. ..	None.	None.	Tolerable state.
106	10	Soonderbuns Forest.	None.	Ditto.	Mile, Inch. 1-4	April, 1830.	Ditto.
107	....	Soonderbuns Forest, S. E. } Portion of River Megna. .. }	Ditto.	Copy.	2-1	None.	Ditto.

MAPS, PLANS, AND LAND SURVEYS.

No.	Residency Special Com- mission, Calcut- ta and Moor- shedabad Divi- sion.	Title of Maps.	Author's Name.	Original or Copy.	Scale.	Date.	Remarks.
108	....	Part of the Country be- tween Pootee Khalee and the Bhyrub River }	B. W. Goldie, } Lieut. Engineers. }	Original.	None.	1831.	In a good state.
109	....	A new and correct Map of the S. E. part of the Soon- derbuns. }	T. H. Madge. }	Copy.	Ditto.	1808.	Old.
110	....	Hooghly Kishenagor and 24-Pergunnahs. }	None. }	Original. ..	Ditto.	None.	{ In a tolerable state.
111	9	Boundary of the Soonder- bun Forest. }	Ditto.				
	Office, Board of Customs Salt and Opium and Marine Board.						
112	A. 1	Plan of the City of Calcutta.	Captain T. Prinsep.	....	Feet, Inch. 500—1 ⁹ / ₁₀	No date.	{ A Lithograph Engraved.
113	2	Tassin's Map of Calcutta. ..	J. B. Tassin.	....	Mile. 4—1	1832.	
114	3	Map of the Suburbs of Cal- cutta. }	Lieut. G. Lindsay, } Engineers. .... }	....	....	1819.	
115	4	Part of Calcutta with the latest improvements (Old) ..	W. Osborn. ....	....	1—4 ³ / ₄	No date.	Engraved.
116	19	Map of the Salt Chokies and their under Chokies on the West side of the Hooghly. }	Not mentioned. .... }	....	5—1 ³ / ₄	Ditto.	{ Reduced from Rennell.
117	25	Map of the Soonderbuns. ..	Ditto. .... }	....	2—1	Ditto.	
118	26	Ditto ditto ditto.	Hodges. }	Original.	5—1 ³ / ₄	1831.	Lithograph.
119	29	South Eastern Part of Soonderbuns. }	Madge. .... }	....	1—3	1829.	{ Lithograph. This Map shews the allot- ment of lands and the names of individuals holding them.

MISCELLANEOUS AND GENERAL PLANS.

	Chief Engi- neer's Office.						
1	10	Plan of the Company's Lands, by }	Barnard. .... }	....	....	....	In good condition.
	Quarter Master General's Office.						
2	111	Map of the Bengal Presi- dency, including the Lieut. Governorship of the Eastern Provinces, and parts of the Country under the Presiden- cies of Madras and Bombay, and of the adjacent inde- pendent states, shewing all the principal Roads and States, the general features of the Country and the Ter- ritorial Divisions, compiled from the latest and most au- thentic Documents, (in two parts.) }	Captain Garden, } A. Q. M. G. .... }	....	16—1	1836.	Injured.

List of Plans in the Lottery Office.

- No 1. Plan of the River side from Chandpaul Ghaut to the New Custom House.
 2. Ditto of ground at Hautcollah.
 3. Ditto of River side.
 4. Ditto of ditto ditto.
 5. Ditto of ditto ditto.
 6. Ditto of ground at Hautcollah belonging to Rajnarain Sain required for the new Road.
 7. Ditto King's Bench Walk.
 8. Ditto, or sketch of the Town of Calcutta.
 9. Ditto of Ruth Ghaut, &c.
 10. Ditto of the proposed road connecting the Chitpore and Simleah Roads.
 11. Ditto of Durmahutta Street, &c.
 12. Ditto of the new Road from the College Square to Circular Road and its vicinity.
 13. Ditto of Clive Street.
 14. Ditto, or elevations of the North and South fronts of the Town Hall.
 15. Book of Plans and levelling sections of the principal Streets through Calcutta, taken by order of Government, and under the Superintendence of the Lottery Committee, in the year 1820, by Lieut. J. A. Schalch, &c. &c.
 16. Plan of Calcutta in four parts, by Lieut. J. A. Schalch 1820.
 17. Plan of Jackson's Ghaut and its vicinity.
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List of Maps and Plans in the Town Hall belonging to the Lottery Committee, dated the 19th July 1836.

- No. 2. Town Hall.
 3. Bowannypore Road to Russapaglah.
 5. Circular Road.
 6. Plan of Calcutta.
 7. Map of Kidderpore.
 9. Bow Bazar Cross Road to Mutchuah Bazar Road.
 10. Mutchooa Bazar.
 11. Intended Road from Mr. Templeton's on the Circular Road to Chowringhee.
 12. New Road leading to Mutchooa Bazar.
 13. Jaun Bazar Road to Collingah.
 14. Steam Engine.
 15. Plan shewing the proposed alteration in front of the Town Hall and Government House.
 16. Bankshall.
 17. Plan of the Bridge to be built opposite Simlah Drain and Cross Chitpore Road.
 19. Durumtollah, Cossitollah, and Bow Bazar to Circular Road.
 20. Drain from Durumtollah Road to the Balliaghaut Canal.
 21. Colingah Street.
 22. Plan Free School Road.

- No. 23. Saum Bazar Bridge.
24. Saum Bazar Road to Circular Road.
25. Bow Bazar to Durumtollah.
26. Plan—a House and Tank.
27. Jane's Plan of Tank.
28. Paterah Ghaut Street.
29. Plan of Ground and Tank at Mudden Barber's.
30. Durumtollah and Bow Bazar Road.
31. Circular Road.
32. Mr. Smith's and Durumtollah Road.
33. Inhabitants of Chowringee Lane.
34. Jaun Bazar and Chowringee Lane.
35. Balliaghaut Road.
36. Balliaghaut Canal Passes.
37. Manicktollah Street and Circular Road.
38. Esplanade of the New Fort.
39. North and South Improvements.
40. Drain mentioned Improving Town of Calcutta.
41. Chitpore Road at Fouzdar's House.
42. Plan of Mr. Howard's Premises.
43. Salt Water Lake.
44. Bankshall Street and Tank Square.
45. Sale of valuable ground at Hastings' Place.
A Map of the Roads and Lanes' City of Calcutta.
47. Circular Road to Jorahtollahs' Roads.
50. Bankshall Street and Council House Street.
51. Allypore Road and General Hospital.
52. Harryparrah Lane.
54. Original Sketch.
55. Map of Calcutta.
56. Iron Railing to the Bankshall.
57. Wellesley Street and Free School Street.
59. Suburbs Bally-Gunge and Bowanypore.
60. Ground South of Fort William.
62. Plan Free School Street and Royd Street.
63. Unfinished Plan part of Calcutta.
66. Short's Bazar.
67. Plan of Ghauts from Bankshall to Chandpaul Ghaut.
68. Plan of Canal.
69. Plan of Churruckdangah Street.
73. King's Bench Walk to Hare Street.
75. Colingah Road.
76. Mahrattah Ditch, Chitpore Bridge to Circular Road.
77. Roads between Jaun Bazar and Collingah Street.
79. Mangoe Lane.
80. Plan of proposed Tank, Beparetollah.
81. Imaumbarry Lane.
82. St. James' Church, &c.
83. Park Street.
84. Plan shewing Improvements made by the Lottery Committee.

- No. 85. Plan of the Dingah Bungah.
89. Plan of New Road, Wellington Street.
90. Moorgyhattah Road.
91. Jackson's Ghaut Road to Chitpore Road at Fouzdar's House.
92. Plan, part of Dingah Bungah Road.
93. Plan of a Tank, &c.
102. Camac's Estate.
107. Chowringhee Road at Park Street.
124. Plan of Fouzdar's Premises, Chitpore Road.
131. Plan of proposed Road from Chitpore Road to College Square.
133. Plan of New Road from Park Street to Wellington Square.
136. Plan shewing Improvements made by the Lottery Committee.
161. Plan from Major Schalch's Map of Calcutta, Ranee Moody Gully, Crooked Lane.
163. General Plan of Waterloo Street.

(Sd.)

JOSEPH DE'HEZETA,

Secy. L. C.

No. 7.

To W. H. MACNAGHTEN, ESQ.

Secretary to the Governor-General Revenue Department.

Mis. Rev. 8th May 1832.

SIR,

I am directed by the Honorable the Vice-President in Council to transmit, for His Lordship's consideration, the accompanying original Letter* from the Military Board, dated the 12th ultimo, with its enclosures, on the subject of the Circular Canal.

I have, &c.

(Signed) J. THOMASON,

Deputy Secretary to Government, Revenue Department.

No. 8.

Revenue, Simla, 12th June, 1832.

To J. THOMASON, ESQ.

Deputy Secretary to Government, Revenue Department.

SIR,

I am directed by the Right Honorable the Governor-General, to acknowledge the receipt of your letter, dated the 8th ultimo, submitting† Correspondence from the Military Board, respecting various Improvements in the Circular Canal.

2. In reply, I am desired to submit such observations, as a careful consideration of the Documents furnished in connexion with this subject has suggested to His Lordship.

3. The obstacles opposed to the successful completion of the Circular Canal appear to be first, the probability that the free entrance of the Stream of the Hooghly into the Canal may raise the surface of the latter so high in the Rainy Season, that the mouths of the Drains leading from Calcutta will be stopped up, and the Drainage thereby impeded, at a time when its free maintenance is indispensable for the safety of the City.

4. To this it is replied by Mr. Prinsep,—First, that as the Marhatta Ditch on the North and Tolly's Nullah at the South extremity of Calcutta, do both receive Drains from some parts of the City, and are both open to free ingress of water from the Hooghly, without the production of any such injurious effects; in like manner no such effects would follow the opening of the Circular Canal; and; Secondly, that the construction of a Lock at the entrance to the Circular Canal, by which the ingres of water from the Hooghly can be checked when necessary, will effectually prevent any injurious rise of water in the Canal's bed.

5. On this point His Lordship is of opinion, that the Lock at the entrance of the Canal is well calculated to answer the proposed end; that it will prevent any injurious rise of water in the Canal, and farther, that boats may pass through the Lock as fast as the nature of a locked passage will admit without perceptibly raising the general Surface of the water in the Canal. This being the case, and the Lock being thus considered an effectual protection against the evil consequences of a flow of water from the Hooghly, it becomes unnecessary to investigate the application of the cases of Tolly's Nullah and the Marhatta Ditch.

* This Paper will be found printed in App. to App. H. marked No. 103 —J. M.

† For this correspondence see Papers printed in App. to App. H. marked. 966 —J. M.

6. To the construction of a Lock it is objected in Col. Galloway's Minute, that to obtain the security proposed by the establishment of a Lock, it will be necessary to keep the Gates shut, that in that case a Lock with a single chamber will only pass 48 boats in the day, and that a Navigation so limited, materially reduces the utility of the Canal. On this point, His Lordship conceives, that the apprehensions expressed are unfounded. Instead of requiring 25 minutes to pass a boat, as stated by Col. Galloway, 6 Minutes would, in this instance, as it is in English Canals, be a liberal allowance. The passage, moreover, instead of being limited to 12 hours in the day, may safely extend to 14, so that the number of Boats that might pass in the day, may be reckoned at 140 instead of 48, and indeed in case of emergency, a stoppage of the Traffic might be prevented by working the Gates throughout the night. The establishment therefore of a Lock with a single chamber appears likely to be sufficient for the extent of Navigation required; and it further appears, that a Lock of this description, built as Mr. Prinsep proposes, might be constructed with a view to an eventual call for a second chamber, without any injury whatever to the original work. Under these circumstances, His Lordship recommends that the work in question be completed at once.

7. The second obstacle to the completion of the work arises from the shoals which are caused at the mouth of each Drain, by which it is alleged, that the Navigation will be impeded to such a degree as to render the Canal of little use.

8. With reference to this point, it is considered by the Military Board, that the alternate flow of water from the Hooghly towards the Salt Water Lake, and vice versa, will have the effect of scouring the bottom of the Canal, and removing a great portion of these shoals. Col. Galloway, on the other hand, considers, that the current in the Canal, will not be sufficiently strong to remove the shoals in question. On this point His Lordship is disposed to coincide in opinion with Col. Galloway. His Lordship does not however consider that the alternate currents will have no effect whatever. On the contrary, it appears to him, that these currents although not sufficiently powerful to force the shoals altogether out of the Canal, will have the effect of spreading those deposits which are now lodged in heaps at the mouths of the Drains uniformly over the Canal's bed, and that when once the communication with the Hooghly is opened, the consequences looked for, will be not a succession of shoals and hollows, but the very mitigated evil of a gradual rise in the Canal's bed. This gradual rise, the effect of the constantly increasing mass of deposits from the Calcutta Drains, will, His Lordship conceives, be little if at all diminished by the current in the Canal, but must be removed by some other means.

9. Col. Wood's Committee have mentioned three modes of effecting this object. First, by Dredging Machines, to the application of which, as costing 15,000 Rs. a year, the Committee decidedly object. Second, by establishing bunds across the Canal, and clearing it out by hand; and, Thirdly by constructing a separate Channel for the Drains to convey the Drainage into the Southern Division of the Lake, out of the line of navigable communication. Col. Galloway appears to have entirely mistaken the meaning of Col. Wood's Committee, where he states, that they mention an annual expenditure of 15,000 Rs. to be indispensable for the clearance of the Canal. The Committee, on the contrary, merely state, that to keep the Canal clear by means of Dredging Machines would cost that sum, but at the same time they recommend another mode of effecting this object, namely, by hand labour. In this recommendation His Lordship is disposed to concur, and he would further suggest, that as soon after the close of the Rainy Season as the fall of the River will admit of the greatest possible Drainage from the Canal, a temporary bund be thrown across the latter immediately beyond the shoals, and then that the stream of the Circular Canal be drawn off as far as possible by opening the Gates of the Lock at low water. By the statement contained in Mr. Prinsep's letter, No. 379, to the Secretary to Military Board,

paragraph 6, it appears, that the level of the water in the Canal will by this means be so far reduced, as to enable the labourers to remove the soil without difficulty; and it would appear that by employing strong working parties, the deposits may be removed without any material interruption of the Navigation, and at an expense far short of the outlay attending the use of Dredging Machines.

10. Another objection to the work, is the apprehension expressed by Col. Galloway, lest the current from the Lake to the River should contaminate the latter, and make the water lying along shore on the Calcutta side of the River, brackish and impure; to this objection may be opposed Col. Galloway's opinion, as recorded in his own Minutes, that the current from the Lake to the River will not have the effect of carrying any portion of the deposits from the Drains into the Hooghly; nor, His Lordship observes, will the small stream which it may be necessary to admit from the Lake to the River, have any sensible effect in communicating the saline properties of the former to the River water, consumed by the inhabitants of Calcutta.

11. It is stated in Col. Galloway's Minute as an objection to the work, that the cost of the Lock is to be 98,912 Rupees, and that the purchase of the ground for it would be perhaps as much more; but the cost of the Lock with a single chamber, as now in progress, is expected by the Board, to be about 50,000 Rupees, and the objection arising from the cost of the ground, whatever might have been its value, is already overruled, as the Lock being commenced, the purchase of the ground must of course have ere this been effected.

12. The above statements comprise all the points that are noticed in the Papers forwarded for His Lordship's consideration, and it only remains to recapitulate in a few words, the mode of proceeding which he would recommend for adoption.

13. In the first place the Lock, which is already in progress, should be completed as soon as possible. The command thus obtained over the water of the Hooghly will enable Government to determine, how far the stream in the Canal will have the effect of removing the shoals. If farther clearance be required, a temporary bund should be established at whatever spot in the Canal the position of the deposited matter may point out, and the Canal should be cleared by hand. It will still remain for experience to shew, how far this clearance by hand will prove an effectual remedy, and whether it may not eventually be necessary to have recourse to a separate line of Drainage; but in the meantime His Lordship conceives, that the clearance by hand, as it involves little expense, and will not in the slightest degree prevent the future undertaking of a more certain, though more costly expedient, is under all circumstances, the measure best calculated for immediate adoption.

14. The original Papers which accompanied your letter are herewith returned.

I have, &c.

W. H. MACNAGHTEN,
Secretary to the Governor-General.

No. 9.

No. 316.

To W. H. MACNAGHTEN, ESQ.

Secretary to the Governor-General, Head Quarters, Simla.

Revenue, the 10th May 1831.

SIR,

I am directed by the Hon'ble the Vice-President in Council to transmit to you the accompanying Dispatch* from the Honorable the Court of Directors, dated 10th November 1830, on the subject of Draining the Salt Water Lake, and altering the course of the Circular Canal, and to request that you will submit it for His Lordship's perusal with the other Papers† specified in the margin.

Revenue Consulta-
tion 16th Feb. 1830,
No. 7 to 14,

I have, &c.

(Signed) J. THOMASON,

Deputy Secretary to Government Revenue Department.

No. 10.

No. 831.

To JAMES THOMASON, ESQ.

Deputy Secretary to Government, Revenue Department.

Revenue Department

SIR,

I am directed by the Right Honorable the Governor-General to acknowledge the receipt of your Letter, dated the 10th instant, with its enclosures, and to request that you will inform the Honorable the Vice-President in Council, that His Lordship proposes to retain the Hon'ble Court's Dispatch of the 10th November last, and the references which accompanied it, on the subject of the Salt Water Lake, until his return to the Presidency.

I have the honor to be,

Sir,

Your most obedient servant,

(Signed) W. H. MACNAGHTEN,

Secretary to the Governor-General.

SIMLA,

The 25th May 1831,

* This Paper will be found printed in App. G. page 28.—J. M.

† These Papers will be found printed in App. G. pages 1 to 27 inclusive.—J. M.

No. 11.

No. 824.

To F. J. HALLIDAY, ESQ.

Secretary to the Government of Bengal.

SIR,

I am instructed by the Fever Hospital and Municipal Committee, to request you to favour them with a Copy of any Minutes in the Government Records, relative to the appointment of a Committee named by the Right Honourable Lord William C. Bentinck, Governor-General, to consider the subject of Draining the Salt Water Lake and the Town of Calcutta, and of continuing the Circular Canal round to the Westward of the Salt Water Lake.

That this Committee was appointed, as well as the names of the gentlemen who com-

* *Names of the Committee.*

D. M'Farlan, Esq. R. D. Mangles, Esq.
 Captain Steel, Dwarkanath Tagore, Col.
 Galloway,—Hoseason, Esq. J. Kyd, Esq.
 Captain Fitzgerald, Ramcomul Sen,
 Col. Tickell, c. b., J. R. Colvin, Esq.
 J. Prinsep, Esq., Captain J. Thomson,
 Captain Forbes.

posed it, which I have inserted on the margin,* appears by a letter addressed by Major Taylor, to Dr. Strong, under date the 27th December 1824, printed in a †paper of Dr. Strong's on the Topography of Calcutta, at page 94 of that Paper, which letter desires the attendance of Dr. Strong on the Committee upon the Tuesday following.

† See App. J. page 65 where a Copy of this Paper is printed.—J. M.

The Fever Hospital and Municipal Committee

have not been able to trace any of the Proceedings of this Committee, nor the Instructions under which they acted.

I have the honour to be,

Sir,

Your most obedient and humble Servant,

(Signed) J. P. GRANT,

MUNICIPAL OFFICE, TOWN HALL,
 18th November, 1840.

Chairman, Fever Hospital and Municipal Committee.

No. 12.

No. 825.

To MAJOR W. N. FORBES,

Mint Master, and Superintendent of Government Machinery, Presidency.

SIR,

The Fever Hospital and Municipal Committee, of which I have the honour to be Chairman, observe in a paper printed by Dr. Strong on the Topography of Calcutta at page 94, mention made of a Committee appointed in 1834, by the Right Honourable Lord William C. Bentinck, to consider the subject of Draining the Salt Water Lake and the Town of Calcutta, and of continuing the Circular Canal round to the Westward of the Salt Water Lake.

The Committee observe your name mentioned as a member of that Committee, but not having been able to trace any Proceedings of this Committee, which would be most material in the prosecution of their present inquiry, they have directed me to request you

APP. I.

N

to give them any information you may possess on this subject, and in particular, where they may apply for the Minutes of the Proceedings of the said Committee, if any Proceedings were taken.

It appears from Dr. Strong's Paper, that the Committee was to meet on one occasion on the Tuesday following, the 27th December 1834, at which meeting Dr. Strong was written to by Major Taylor, to attend.

I have the honour to be,

Sir,

Your most obedient and humble Servant,

(Signed) J. P. GRANT,

MUNICIPAL OFFICE, TOWN HALL,

The 18th November, 1840.

Chairman, *Fev. Hosp. and Munl. Committee.*

NOTE.—The like Letter was addressed to Dr. McFarlan, Esq. and Capt. W. R. Fitzgerald (Engineers) the reply of the former Gentleman is printed in App. I. at page 12 and that of the latter on this page of this App marked No. 13.—J. M.

No. 13.

No. 285.

TO THE HONORABLE SIR J. P. GRANT,

Chairman, Fever Hospital and Municipal Committee.

SIR,

In reply to your Letter, dated the 18th instant, I have the honor to inform you, I am not aware that any Minutes of the Proceedings of the Committee appointed in 1834, by the Right Honorable Lord William C. Bentinck, to consider the subject of Draining the Salt Water Lake, and of continuing the Circular Canal round to the Westward of the Salt Water Lake were recorded, on the only occasion that the Committee ever assembled; viz. on the Tuesday following the 27th December 1834, as mentioned in your letter.

I have the honor to be,

Sir,

Your obedient Servant,

FORT WILLIAM,

28th November, 1840.

W. R. FITZGERALD,

Civil Architect.

No. 14.

TO THE HONORABLE SIR J. P. GRANT,

Chairman, Fever Hospital and Municipal Committee.

SIR,

In reply to your Letter of date the 18th instant, I have the honor to state, that in conjunction with the late Captain John Thomson, then Superintendent of Canals, I was appointed a Member of a Committee to consider, in connexion with the work then in progress in the portion of the Eastern Canal passing through the Salt Water Lakes, the practicability of Draining the adjacent Low Lands, and that as the Report prepared was forwarded by Captain Thomson, to the Military Board, I conceive it is probable a copy* of it may be found amongst the Records of his Office, in the year adverted to by Dr. Strong's Paper, 1834.

* For which see
App. G. page 37.—
J. M.

2nd. Having previously attended various Meetings, or Committees, directed to assemble at the Government House, with reference to this subject, in the presence of the Right Honorable Lord William Bentinck, it is only from not having been aware that any Report resulted from these, that I have been induced to conclude the Report above mentioned was the one alluded to by Dr. Strong ; but if the conclusion is correct, Captain Boileau, of Engineers, the present Superintendent of the Circular and Eastern Canals, will readily be able to furnish a Copy of the Report.

3rd. According to the best of my recollection, its substance was, that if the disputed claims of neighbouring Zemindars to property in the Lands and Fishings of the Lakes could be arranged, the object in view could be accomplished.

4th. Believing that, in consequence, a reference on these points was made to the Local Commissioner, I have not since learned what was the result of the enquiry.

I have the honor to be,

Sir,

Your most obedient and humble Servant,

W. N. FORBES,

MINT,

November, 20th 1840.

Mint Master, and Superintendent Government Machinery.

No: 15.

No. 830.

To F. B. KEMP, ESQ.

Commissioner of the Soonderbuns.

SIR,

In answer to a Letter from me requesting information regarding the Proceedings of a Committee appointed by Lord William Bentinck, to consider of the Draining of the Salt Water Lake, and continuing the Circular Canal, of which that Gentleman appeared to be a Member, Major Forbes states, that he believes that a reference on these points was made to the Local Commissioner, and that he has not since learnt what was the result of the inquiry.

I have the honor to request of you, for the use of the Municipal Committee, of which I am Chairman, any information you may possess regarding the existence and the nature of the reference, and its result if any.

I have the honour to be,

Sir,

Your most obedient and humble Servant,

(Signed) J. P. GRANT,

Chairman, Fev. Hos. and Munl. Committee.

MUNICIPAL OFFICE, TOWN HALL,
23rd November, 1840.

No. 16.

No. 838.

To F. B. KEMP, ESQ.

Commissioner of the Soondurbuns.

SIR,

I had the honour to address you a Letter on the 23rd November 1840, at the desire of the Municipal Committee, to whom the Government have referred the subject of the Drainage of the Salt Water Lake, in which I requested you to furnish me, for the use of the Committee, with any information you might possess regarding the existence, the nature, and the result, if any, of a reference said to be made to the Local Commissioner by Lord William C. Bentinck, regarding the Draining of the said Lake, and the continuing of the Circular Canal, to which Letter I have not yet had the honour to receive an answer.

I observe in a Minute of Lord William Bentinck, of date 16th February 1830, it is remarked by him, that the Salt Water Lake had been disposed of in perpetuity, paying a rent of about 4,000 Rupees to Government.

The profit of the Zemindars, His Lordship says, as he learnt from the Commissioner, from the Fisheries, from Reeds, and from Lands from which the water had receded, amounted to about 16,000 Rupees.

He learnt from the same source that the proprietors would not be unwilling to sell their property. There was a doubt whether the Land as well as the Water and the right of Fishery belonged to the Zemindar or to the Sircar. The right he said was about to be tried.

It would be very obliging if you could inform the Committee, whether the points stated in the above paragraph of this Minute, so far as the profits to the Zemindars, and their willingness to sell may now be taken to be correct, and whether the doubt as to the property being in the Zemindar or in the Sircar still subsists, or the trial alluded has been had and the point settled, and how.

Your answer at your earliest convenience will oblige the Committee. .

I have the honour to be,

Sir,

Your most obedient and humble Servant,

(Signed) J. P. GRANT,

Chairman, Rev. Hos. and Muni. Committee.

MUNICIPAL OFFICE, TOWN HALL,

5th January, 1841.

No. 17.

No. 835.

TO THE HONORABLE CAPTAIN OSBORNE,

Military Secretary to the Governour General.

SIR,

The Fever Hospital and Municipal Committee, of which I have the honour to be Chairman, observe in a Paper* printed by Dr. Strong, on the Topography of Calcutta, at page 93, mention made of certain Papers of the late Dr. Francis Hamilton Buchanan, having been returned in 1830, by Dr. Strong, to Major Benson, Military Secretary to the Governour General.

The Committee are desirous of obtaining the above Papers, and have directed me to request, that you will have the goodness to cause a search to be made for them amongst the Records of your Office.

I have the honour to be,

Sir,

Your most obedient and humble Servant,

(Signed) J. P. GRANT,

MUNICIPAL OFFICE, TOWN HALL,
9th December, 1840.

Chairman, Fev. Hosp. and Municipal Committee.

No. 18.

No. 1260.

SIR,

Govt. House, 21st December.

I have to apologise to you for the delay which has occurred in replying to your Letter of the 9th instant, owing to mistake in my office.

I regret to say, that it is out of my power to comply with your wishes relative to the Papers of the late Dr. F. H. Buchanan—all the Records from this Office having been removed on Col. Benson's leaving it.

I have the honor to be,

Your obedient Servant,

W. G. OSBORNE,

Military Secretary.

J. P. GRANT, ESQ.

&c. &c.

* Referring to that in the Quarterly Journal of the Calcutta Medical and Physical Society—but See App. J. Paper marked No. VII. i. at page 64, where a copy of the Paper referred to is printed.—J. M.

No. 19.

Extract—Proceedings of the Committee upon the Fever Hospital and Municipal Improvements, 7th January 1841.

The Chairman states, that in answer to an inquiry by himself to Major W. N. Forbes, he had received a private communication, dated 16th January 1839, from that gentleman, stating, that the Salt Water Lake might be easily Drained; that to silt it up it would be necessary to admit alluvial-charged water at the head of it from the Hooghly—a measure which he says, he perceives Dr. Martin's excellent Paper in some degree objects to. That the main practical difficulty, is, that the ground composing the Lake, is private property; and that for giving it up to Government for Improvement, the Proprietors ask nine Lacks of Rupees—a sum he observes, that makes a very unsatisfactory addition to the indispensable cost of the Drainage works, viz. the Cut from the Hooghly, Bunds, Sluices, &c.; that he Captain F. is not acquainted with the Guiana works, but will endeavour to obtain it; and that Captain Boileau, the Superintendent of Canals, would be the best able to afford the Committee any information they might require regarding the Salt Water Lake.

No. 20.

No. 7.

To J. P. GRANT, ESQ.

Chairman, Fev. Hosp. and Municipal Committee.

SIR,

I have the pleasure to acknowledge the receipt of your Letter, No. 838, of the 5th instant.

2nd. I can find no correspondence in the English Department of this Office respecting the Salt Water Lake beyond the Minute of Lord W. Bentinck, which document it appears you have opportunities of referring to.—I conclude Mr. Dampier, who held the office of Commissioner in the Soonderbuns in 1830, must have been in personal communication with his Lordship on the subject; a reference to Mr. Dampier might clear up this point, and elicit the information sought for by the Committee.

3rd. I am not aware of the willingness or otherwise of the Zemindars to sell their property, and without the Native Records of my Office to refer to, I am unable to state whether any suit involving the Right of Government to the Lands and Right of Fishery of the Salt Water Lake was ever instituted, or the result thereof. All my Records have left for Backergunge, on my arrival at that place, I will cause a search to be made, and inform you of the result.

I have the honor to be,

Sir,

SOONDERBUNS COMMISSIONER'S OFFICE,

ALLIPORE.

The 9th January, 1841.

Your most obedient Servant,

F. B. KEMP,

Commissioner.

P. S.—I observe in the Office Registry of Cases under Reg. II. of 1819, and III. of 1828, a suit for 60,000 Beegahs Salt Water Lake, in which the Government claim was dismissed by Mr. Dampier, on the 21st January 1830.

F. B. KEMP,

Commissioner.

No. 21.

No. 112.

To THE HONORABLE SIR J. P. GRANT, *Kt.**Chairman, Fever Hospital and Municipal Committee,*

Revenue.

HONORABLE SIR,

I am directed by the Right Honorable the Governor of Bengal to acknowledge the receipt of your Letter of the 18th November last, and in reply to state, for the information of the Committee, that after a strict search amongst the Records of this Office, no Minutes or Papers* having reference to the Proceedings of the Committee, named on the Margin of the 2nd Para. of your Letter, are forthcoming.

I have the honor to be,

Honorable Sir,

Your most obedient Servant,

J. H. YOUNG,

FORT WILLIAM,
The 19th January, 1841.

Deputy Secretary to the Government of Bengal.

No. 22.

*Extract—Proceedings of the Committee upon the Fever Hospital and
Municipal Improvements, 4th February 1841.*

The Chairman and Capt. Boileau report, that they had visited the Dhurrum-tollah Cess Pool and Entally Canal in Company with G. J. Gordon, Esq. and had inspected the digging going on there, with the view of forming an opinion of the quantity of Silt deposited in the upper part of the Entally Canal from the flow of the Tide from the Salt Water Lake.

They observed, that there are none of the inner Drains of the Town which are discharged into that part of the Canal, and but a very few Drains of any sort which deposit apparently very little Silt. The whole therefore, of the Silt there deposited, may be taken as furnished by the Tidal Waters, and it appears from Capt. Boileau's report, that this is so

* NOTE.—From certain Memoranda found in the Government of India Proceedings of the 5th March 1835, Nos. 8 to 11, and from other Papers which have come under the observation of the Municipal Committee, it appears that no Minutes were Recorded of the Proceedings of the Committee convened by Lord Wm. Bentinck, on the Tuesday following the 27th Dec. 1834, or, according to one of the above Memoranda, by R. D. Mangles, Esq. in pencil, as follows.—“We met once or twice, but did nothing but talk;” and the evidence obtained by the Municipal Committee, and printed at pages 37 to 40 of App. I. and App. J. page 29, that any thing beyond mere desultory discussion took place at that meeting. No orders were passed by the Government of Bengal on the Military Board's Committee's Report on the Drainage of the Salt Water Lake, App. G. page 36; but that Committee's Report was brought to the notice of the Hon'ble Court in a Dispatch of the Council of India, of date the 23d Dec. 1835, para. 82, and the subject from that period not resumed (See App. G. page 53, Paper marked No. VIII) till the receipt of the Hon'ble Court's Dispatch, (Revenue Department No. 4) of the 2d May 1838, to the Government of Bengal (See App. G. page 54, No. IX) when the further consideration of the matter was transferred to the Municipal Committee, in a Letter from Mr. Secretary Halliday of the 18th Sept. 1838—See App. G. page 56.—J. M.

great as to cause an accumulation of $3\frac{1}{4}$ to $4\frac{1}{8}$ feet in the course of 4 or 5 years, which is now dug out once in that time by manual labour. They observed, that in the Circular Canal, which has a flow of Water into it from the River at high water through the Sluice, there appeared to be no deposit, the Canal being kept sufficiently clear for the purposes of Navigation by the periodical flow of water from the Hoogley to the Salt Water Lake ; and Capt. Boileau states, that the Circular Canal has never received or required cleansing since it has been under his management. It would appear therefore, that the observation of Lord Wm. Bentinck, in his Minute App. G. No. 1, page 3, "the water by which the Lake and the Entally Canal are now filled is exclusively Tidal, and clear," is founded upon a mistake with regard to the clearness of that Water in reference to assisting the Silting process, although undoubtedly it must be charged with less alluvial matter than the waters of the Hoogley.

Secondly, it appears that the flow of water through a Lock Gate, of the size of that of the Circular Canal, is sufficient to keep the Canal clear for the purposes of Navigation.

The crowding of the Craft in the Circular Canal, and the great impediment thereby caused to the Navigation, was very striking, although perhaps the boats were somewhat more crowded from the closing the head of the Entally Canal, rendered necessary by the digging out of the deposit—but the above Members cannot but recommend to the Committee to inquire and consider whether it would not be very material, in order to enable the Baliaghatta, the Entally, and the Circular Canals to afford all the advantages to the Navigation of which they are capable, that a direct communication should be opened between the Entally Canal and Tolly's Nullah ; and whether a Harbour or Basin ought not to be constructed nearer the point where the boats frequenting the Circular Canal usually deposit their lading, than where the present Harbour or Wet Dock is situated, is not also necessary for this purpose. The Members of the Committee observe, that several considerable Drains empty themselves into the Circular Canal, but it was observed by Capt. Boileau, and indeed was sufficiently apparent, that the quantity of Silt they brought into the Canal does not impede the Navigation, but is entirely swept away by the periodical current admitted into the Canal through the Lock Gate.

No. 23.

No. 870.

To J. CARNIE, ESQ.

Government Lithographic Press.

DEAR SIR,

The Committee upon the Fever Hospital and Municipal Improvements are desirous of being informed by whom the accompanying Table of Levels* was compiled, and where lithographed ; if in your power, will you be so good as to afford the Committee this information. I think the Table must have been lithographed at the Government Press.

I am, Dear Sir,

Yours faithfully,

J. MORRIS.

Clerk to the Committee.

(Signed)

TOWN HALL,

11th March 1841.

*Referring to that inserted opposite page 14 of App. I. —J. M.

No. 24.

DEAR SIR,

The Table was Lithographed at this Press some 6 or 7 years ago, and as far as I can recollect, on account of the Surveyor-General's Office. I am, however, not aware by whom it was compiled. I have given direction to look up the original application, to ascertain with certainty, for what office it was Lithographed; it will take sometime to effect this. When I am able to ascertain the fact, I shall acquaint you forthwith.

11th May, 1841.

To J. MORRIS, ESQ.

Yours very truly,

A. CARNIE.

No. 25.

MY DEAR SIR,

I regret to say, that I have been unsuccessful in my research; the Assistants are so busily occupied with their current duties, that they have but little spare time to look up the Records without extra assistance.

27th May, 1841.

To J. MORRIS, ESQ.

Yours very truly,

A. CARNIE.

No 26.

No. 249.

To J. P. GRANT, ESQ.

Chairman, Fever Hospital and Municipal Committee.

SIR,

I have the honor to acknowledge your Letter, No. 914, dated 31st ultimo, calling attention to your correspondence with my predecessor regarding the Government right to certain Fisheries near the Salt Water Lake. In reply, I beg to state, that on 21st December 1831, Mr. Dampier, then Commissioner of the Soonderbuns, dismissed the claims of Government, and decreed in favor of the Zemindar, which decision was upheld on appeal by the Special Commissioner on the 25th April 1831 [Qy. 1832].

2nd. What the profits of the Zemindar may be I am unable to state, neither can I inform you as to his willingness to sell his property. Should the Zemindar reply to the questions which I have put to him on the subject, I shall have much pleasure in acquainting [you] with the result.

I have the honor to be,

Sir,

SOONDERBUNS COMMISSIONER'S OFFICE,

ALLIPORE,

The 10th September, 1841.

Your most obedient Servant,

M. SHAWE,

O. Commissioner.

No. 27.

No. 1515.

To THE HONORABLE SIR J. P. GRANT,

Chairman of the Municipal Committee, Calcutta.

SIR,

In reply to your Letter of the 31st ultimo, I have the honor to acquaint you, that I believe the profits of the owners of the Salt Water Lake, i. e. of those to whom the Lake was made over in perpetuity, were about 16,000 Rupees per annum; but there are other Zemindars holding Lands on the borders of the Lake, who also derive some profits from the Fisheries immediately adjacent to their estates, and these latter would require to be indemnified for the loss they would sustain by the proposed Drainage. I recollect perfectly well, estimating roughly the probable expence of purchasing the Lake, and indemnifying all parties at five Lakhs of Rupees; but I have reason to think that the whole might be now purchased at a less cost; the Lands on the borders of it having suffered much deterioration from the great Inundation of 1833, from which they have not yet recovered.

2nd. I saw one of the proprietors of the Lake, holding an eight anna share, when I was in Calcutta last year, and he then expressed a willingness to dispose of his property in it; and indeed asked me, if the measure of Draining it was in contemplation with the proprietor of the remaining moiety. I have had no communication since the decision of the suit you refer to, but I suppose he would now be willing, as he was then, to part with his share.

3d. I decided the suit for the Assessment of the Lands from which the water had receded in favour of the Zemindars; my decision was appealed from by the then Revenue Commissioner, Mr. E. R. Barwell, but it was finally upheld by the Special Commissioner, the late Mr. Walpole, so that the right of the Zemindars in the Property is completely settled.

I have the honor to be,

Sir,

OFFICE OF SUPERINTENDENT OF POLICE,
LOWER PROVINCES,

Your most obedient servant,

W. DAMPIER.

*The 1st September, 1841.**Superintendent Police, L. P.*

No. 28.

No. 921.

To D. MACFARLAN, ESQ.

Esq. Esq.

SIR,

The Committee upon the Fever Hospital and Municipal Improvements will be obliged by your furnishing, for their information, answers to the following queries:—

1. Is the Dhurrumtollah Drain so formed as to allow the Tides of the Hooghly to flow regularly through it into the head of the Intallee Canal, thus preventing, in some measure, a stagnation in that Canal?

2. If the Dhurumtollah Drain is formed as above, will you be so good as to state, whether it was originally so formed, or has it been altered to effect the above end; if so, please to state at what period that alteration took place?

A reply at your early convenience will oblige, as the above inquiry has reference to some matter now in the press.

I have the honor to be,

Sir,

Your most obedient and humble Servant,

(Signed) J. MORRIS,

Clerk to the Committee.

MUNICIPAL OFFICE,
TOWN HALL,
15th September, 1841.

No. 29

No. 435.

TO THE FEVER HOSPITAL AND MUNICIPAL COMMITTEE,
Calcutta.

GENTLEMEN,

In reply to a letter dated 15th September 1841, from Mr. Morris to my address, I beg to inform you, that the Dhurumtollah Drain is not so formed as to allow the Tides of the Hooghley to flow regularly through it; no such effect as a permanent scouring of the latter can result from the present construction of the drains.

2. A report by Mr. R. J. Rose, the Superintendent of the Calcutta Roads, is annexed, shewing the depth of the Drains at the east end of Dhurumtollah Street, with his observations on the subject of Mr. Morris' letter.

I have the honor to be,

Gentlemen,

Your most obedient Servant,

CALCUTTA POLICE OFFICE,
17th September, 1841.

D. McFARLAN,
Chief Magistrate.

No. 29. (A)

Copy.

REPORT BY THE SUPERINTENDENT OF ROADS.

The depth of the Drain on the East side of Cossitollah, at its intersection with the main Drain on the North side of the Dhurumtollah, is	..	..	Feet	3	7
The depth of the latter at this point is	..	..	..	3	4
That on the South West end of the Cossitollah Street, is	..	..	..	4	2

The River Water does find admittance into the main Drain on the North side of Dhurumtollah Street by the Tunnel, which passes through the Bankshall premises, Hare Street, Old Court House Street, and Waterloo Street, but this happens only during the height of the Spring Tides during the Freshes.

I am not aware that these Drains were constructed with the view of admitting the River Tides to flow into the Dhurumtollah Drain. The water in this drain never stagnates, as it has an excellent slope or fall, throughout its whole distance to the Canal. A basin has been formed at the head of the Entally Canal for the reception of the silt from the Town Drains. No stagnation in it, can therefore arise from this cause.

(Signed) R. J. ROSE,
Superintendent of Roads.

CALCUTTA,
17th September, 1841.

(True Copy,)
D. McFARLAN,
Chief Magistrate.

No. 30.

No. 53.

To J. P GRANT, ESQ.

Chairman, Fever Hospital and Municipal Committee, Calcutta.

SIR,

With reference to your letter No. 914, of the 31st August last, and previous correspondence connected therewith, I have the honor to forward copy of my Roobocary of this

* 1 Document from Ramchunder Roy Chowdry, &c.
1 Ditto from Pran Kisto Roy Chowdry, &c.
1 Ditto from Kallee Kunto Roy Chowdry, &c.
1 Ditto from the Collector of Zillah 24-Pergunnahs.

day's date, together with four Original Documents as per margin,* which I request may be returned for record in this Office, when no longer required by the Committee: from which it would appear that the parties are willing to dispose of their property on obtaining what *they* consider its value.

I have the honor to be,

SOONDERBUNS COMMISSIONER'S OFFICE,
CAMP RAMNABAMNA,
The 11th Feb. 1842.

Sir,
Your most obedient Servant,
M. SHAWE,
O. Commissioner.

NOTE.—The Municipal Committee do not think it necessary to print the enclosures transmitted with the above Letter.—J. M.

No. 31.

No. 7.

*From the Officiating Deputy Secretary to the Government of Bengal in
the Judicial Department.*

TO THE CHAIRMAN TO THE FEVER HOSPITAL AND MUNICIPAL
COMMITTEE.

Judicial Department.

SIR,

Dated Fort William the 29th December 1842.

I am directed by the Honorable the Deputy Governor of Bengal to forward for the information of your Committee, the accompanying original extract, No. 216, from the Proceedings of Government in the General Department, dated the 26th October last, containing transcript of a letter from the Honorable the Court of Directors, with a communication from Mr. Henry Wood on the Drainage of Calcutta, and the protection of the City from Inundation during Spring Tides.

2nd. The Map alluded to in Mr. Wood's Letter shall be forwarded to you when received.

I have the honor to be,

Sir,

Your obedient servant,

(Signed) J. S. TORRENS,*Officiating Deputy Secretary to the Government of Bengal.*

FORT WILLIAM,
The 29th December 1842.
EXD. H. Court.

No. 31. (A)

No. 216.

*Extract from the Proceedings of the Honorable the Deputy Governor of
Bengal in the General Department, under date the 26th of October, 1842.*

No. 19 of 1842.

Our Governor of the Presidency of Fort William in Bengal.

Public Department.

We transmit as a number in the Packet for your consideration, the copy of a letter which we have received from Mr. Henry Wood, on the Drainage of Calcutta and protection of the City from Inundation during Spring Tides: the copy of a Map which accompanied Mr. Wood's letter is also forwarded.

We are, &c.

(Signed) J. L. LUSHINGTON,
" JOHN COTTON,
" H. LINDSAY,
" A. GALLOWAY,
" E. MACNAGHTEN,
" J. MASTERMAN,
" W. B. BAYLEY,
" W. H. C. PLOWDEN,
" G. LYALL,
" H. WILLOCK,
" H. ST. G. TUCKER,
" C. MILLS,
" J. W. HOGG.

LONDON,
The 24th August 1842.

No. 31. A⁽¹⁾

J. C. MELVILL, ESQ.

SIR,

I am induced to lay before the Honorable Court of Directors, the accompanying Map of the Suburbs of Calcutta, taken from a Survey made in the year 1817, with the following observations on the Drainage of the Suburbs and the protection of the Town from future Inundations from the side of Salt Water Lake and the sudden rise of the Sea.

2. My attention was called to the state of the Town and Suburbs, and the Country lying between it and Saugur Island, from having been employed on a Survey of the Town on my first going out to India, and having been about the same period directed by the Chief Engineer to report on the state of the Mahratta Ditch, for the purpose of constructing the Circular Road round Calcutta. At a subsequent period, my attention was called to the Levels of the Town to enable me to construct the aqueduct, and with the view of aiding Mr. Elliot in his useful labors in Draining the Town and Suburbs with the assistance of the convicts. The country lying between Saugur Island and Calcutta was under my particular observation, when, as an Assistant Engineer, I was employed to aid in devising Plans for the establishment of a Telegraphic communication between the Presidency and the Sand Heads, at the period the French invaded Egypt, and when I was employed in the same capacity to construct the Military works at the mouth of the Roopnarain River, opposite to the Sands of the James and Mary, below Fultah. The Country between Ganjam and Culpee, along the coast, came under my observation, from having been obliged to march through it in 1800, when in the possession of the Mahrattas, and from being employed as an Assistant Engineer in the District of Cuttack, immediately on its falling into our possession, when the Engineer Department had to map the country finally, to enable me to Plan and Estimate a Canal of communication between Calcutta and Channel Creek, for the purpose of communicating with the upper anchorage of Saugur Island, which I laid before the Government. I inspected the country lying between the Presidency and Culpee and onwards to Channel Creek, and made myself acquainted with its localities.

3. At Spring Tides the level of the River Hoogly is higher than the level of the Town, and the Esplanade of the Fort is often flooded by the River. The Ditches of the Suburbs are on such occasions filled by the rising of the Tides in Salt Water Lake, and the Country between the Lake and Suburbs, as well as the country between Salt Water Lake and Dum-Dum, and on the borders of Tolly's Nullah and the lower part of Garden Reach, are flooded, and become one sheet of water during the rainy season, at the height of the Spring Tides.

4. The Records of the India House will shew the great loss of life that has been caused by the Sea breaking over its natural boundaries, and laying the country on its borders under the water. The district of Ganjam, Cuttack, Balasore, and Hidgelee, the lower parts of the Hoogly River and Dacca, have, at different times been visited by Inundations of the Sea, when thousands of lives have been lost and Cattle destroyed, and large tracts of Country have been laid waste, and rendered unproductive for long periods, by the deposit of Salt, and the destruction of the population. In addition to the great loss of lives by the Inundation, sickness has invariably followed, and carried off thousands, and it is to avoid the result of such calamitous visitations, that I am induced to trouble you on the present occasion.

5. I need only call the attention of the Honorable Court to the circumstance of the level of the Town of Calcutta, and all the Country between it and the Sea at Saugur Island, being below the level of high Spring Tide, and that a rise of three or four feet of the Sea above its natural level at Spring Tides by a gale of wind from the South-east, would

Map

OF THE SUBURBS OF

CALCUTTA

between Burrigore, the Salt Water Lake and
Garden Reach.

Surveyed in 1817

Drawn by G. B. S. and Printed at the Government Office, Calcutta. A. S.



Table of Police Stations in the Suburbs of Calcutta under John Elliot Esq ^r Magistrate & Judge Secy.				Table of Police Stations along the Boundary of the Town of Calcutta.	
Index Letters	Names of Thannahs	Index Figures	Dependent Chokies	Index Figures	Names of Thannahs
		a	Cossipoor	1	Chulpoor Bridge



Table of Police Stations in the Suburbs of Calcutta under John Elliot Esq ^r Magistrate & Judge Sec.				Table of Police Stations along the Boundary of the Town of Calcutta	
Index Letters	Names of Thannahs	Index Letters	Dependent Chokees	Index Figures	Names of Thannahs
A	Chitpore	a ^o	Cossipore	1	Chitpore Bridge
		a ^o	Juliapurrah	2	Kaulpohre
		a ^o	Seely	3	Saum Bazar
		a ^o	Belgauchi	4	Oelladongah
B	Manicktollah	b ^o	Rovangasty	5	Hoogulpoorah
		b ^o	Ballaigaut	6	Manicktollah
		b ^o	Entallee	7	Humalpoorah
		b ^o	Kurrah	8	Dajaram Lechur
C	Kalighat	c ^o	Bowampoor	9	Boutakana
		c ^o	Tollygunge	10	Moulah dugau
		c ^o	Belah	11	Nuwahs bazar
		c ^o	Jerul	12	Kurrah ke gonstan
D	Kidderpore	d ^o	Waulgunge	13	Achery tollah
		d ^o	Boorkulas	14	Brija tollah
		d ^o	Bulrampoor	15	Hospital
				16	Jerul Bridge
				17	Kidderpore Bridge

Proposed Embankment round the Suburbs of Calcutta

Section of Proposed Embankment and Canal

Assumed Level of the Land below the Level of the Tide at Chandpaul Ghaut to be 10 Feet

Canal to supply Earth for the Embankment

Level of Embankment

Level of Highest Tide at Chandpaul Ghaut

sweep away the whole population, to call its serious attention to measures calculated to prevent so heavy a calamity.

6. The wooded belt of the Soonderbunds, has probably tended to protect the Country up to the present period from the visitations which have inundated other districts, the effects of which are recorded on the Proceedings of the Honorable Court. These woods I understand are clearing away, and although their breadth and yielding nature have broken the force of the Sea during many severe gales of wind, they have been unable to prevent very severe loss to the native population; and if I am correctly informed, the Inundation from the Sea in 1830-31, extended to the Suburbs of Calcutta, washing over Saugur Island and the Country about Culpee and Diamond Harbour, destroying the inhabitants and much property, and causing, on the water subsiding, dreadful sickness amongst the European and Native population of the Town of Calcutta and throughout the Country.

7. The Banks of the River Hoogly are some feet higher than the level of the Country inland, and the Town of Calcutta is drained into Salt Water Lake; Garden Reach is drained into the River through the Masonry sluices erected by Colonel Pearce at the Garden called after his name, and the Water Channels leading to these sluices need only be kept clear and open, to insure the Reach being kept dry and free from the effects of Inundation, if the Tides are kept out, and the Sea prevented from washing over the Reach in the direction of Budge Budge and the lower part of the River.

8. I would propose for the protection of the population of the Town of Calcutta and its Suburbs, as well as Garden Reach, that a Circular Bund or Embankment be erected beyond the inhabited part of the Suburbs, and along the Edge of the Salt Water Lake and other swamps surrounding the Suburbs, of the height of three feet above the highest level of the highest Tide at Chandpal Ghaut, and that the breadth of the Embankment may be made twenty feet at top; with sloping of sides at an angle of 45° , and that this Bund or Embankment may be formed by earth excavated from a Ditch or Canal between it and the Suburbs, leaving a clear space of 50 feet between the base of the Bund and the edge of the Ditch, to enable it to resist the weight of the Sea water which may be thrown against it by any sudden rising of the Sea. The Ditch or Canal will be useful in receiving the contents of all the Drains of the Town during the rains, and self-acting Sluices may be constructed on the principle of the Sluice erected by Colonel Pearce in Garden Reach, to admit of the Canal, at low water, discharging itself through the Embankment into the Salt Water Lake.

9. If such a work be constructed, the Salt Water of the Tides will be kept out of the Ditches of the Suburbs which now cause much sickness, and the Town and Suburbs will be secured from Inundation, and should the Sea unfortunately wash over the Country, the population of the Town will have a place of refuge to retire to pending the height of the Inundation, even if the Sea should force its way through the Embankment at any weak point.

10. The work may take some considerable time to finish, but if the convicts are employed in the construction of it, under the superintendence of an Engineer Officer, they will be found pretty competent to the task, and the Jails at Allipore are sufficiently commodious to collect them towards the termination of the rainy season, for the purpose of sending them out in Tents to work during the dry season, the only period of the year when the work can be carried forward.

11. The work when finished, and during its construction, will require the constant, unremitting attention of an Engineer Officer, to prevent the natives from stopping the water Channels for the purpose of taking fish, and for irrigating their Lands; and I would beg to suggest for the consideration of the Honorable Court, that much advantage would be gained if the Superintending Engineer were directed to proceed to Holland for the purpose of inspecting the Embankments in that Country, accompanied by two or three young men who

have qualified for the Engineers at Addiscombe. The two countries are similar in every respect, and the Plans adopted by the Dutch with success to protect Amsterdam, and the whole of Holland from the encroachment of the Sea, cannot but prove most useful to our Engineers in Bengal.

12. The Country between Culpee and Calcutta is a succession of Jheels and Swamps, and in the rains one sheet of water. The outlets of these Jheels and Swamps are connected with the River Hoogly and the Soonderbunds, and it is probable that if attention were paid to Bunding out the High Tides, that much of the Country might be Drained by erecting self-acting Sluices at the outlets of the Jheels and Swamps at low water, and the Lands would then become more healthy, and capable of producing good rice crops.

BRAMDEAN HOUSE,
The 23rd July 1842.

I am, &c.
(Signed) HENRY WOOD.

No. 31. (B)

Ordered—That a copy of the above Letter from the Honorable the Court of Directors and of the Communication from Mr. Henry Wood therein referred to, on the Drainage of Calcutta and protection of the City from Inundation during Spring Tides, be transmitted through the Judicial Department of the Government of Bengal, to the Military Board for information. The Map therein mentioned will be forwarded as soon as received.

A true extract,

Cd.
T. R.

(Signed) W. B. BAYLEY,
Deputy Secretary to the Government of Bengal.

No. 32.

(No. 165.)

From the Officiating Deputy Secretary to the Government of Bengal in the Judicial Department,

TO THE CHAIRMAN TO THE FEVER HOSPITAL AND MUNICIPAL COMMITTEE.

Dated Fort William, the 9th January 1843.

Judicial Department.

SIR,

With reference to the second paragraph of my Letter No. 27, of the 29th ultimo, I am directed by the Honorable the Deputy Governor of Bengal, to forward to you the accompanying Map* alluded to in Mr. Wood's communication on the Drainage of Calcutta.

I have the honor to be,

Sir,

Your most obedient servant,

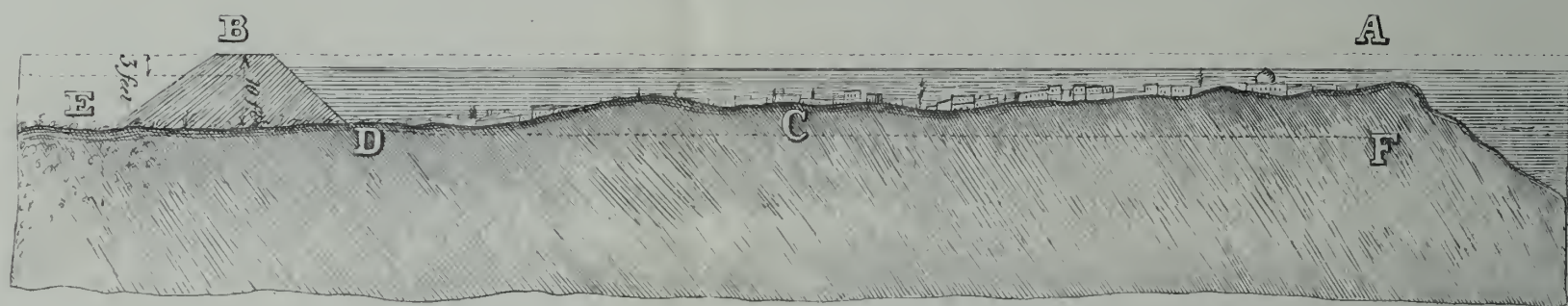
(Signed) J. S. TORRENS,

Officiating Deputy Secretary to the Government of Bengal.

* Marked No. 32. (A)—J. M.

FORT WILLIAM,
The 9th January 1843.
EXD.
H. Court.





No. 33.

No. 999.

TO MAJOR W. N. FORBES, *Engineers,**Mint Master, &c. &c. &c.*

DEAR SIR,

I have received the enclosed* Papers from the Government, and have laid them this day before the Committee upon the Fever Hospital and Municipal Improvements. The Committee are desirous of imposing on you the trouble of drawing up a short note upon Mr. Wood's Letter to the Court of Directors, which may enable the Committee to make a satisfactory answer upon the subject to the communication received from the Government, I have therefore the pleasure to enclose the Papers as per margin.

I am,

Dear Sir,

Most sincerely yours,

(Signed) J. P. GRANT,
Chairman, Municipal Committee.

MUNICIPAL OFFICE,
TOWN HALL,
5th April, 1843.

* Viz. Those marked in this Appendix as No. 31, to No. 32(A) inclusive.—J. M.

No. 34.

TO THE HONORABLE SIR JOHN PETER GRANT,

Chairman, Municipal Committee of Calcutta.

DEAR SIR,

I have the honor to acknowledge the receipt of your Letter of date the 5th of April, with its enclosures, regarding a communication from Mr. H. Wood to the Honorable the Court of Directors on the subject of the Drainage of Calcutta, and on the protection of the City from Inundation during the Spring Tides; and in reply to state, that careful examination of the levels of Calcutta and of the country adjacent have induced the conclusion, that the construction of the very extensive and costly work proposed by Mr. Wood; viz. the erection of a Circular Bund or Embankment beyond the Suburbs of the City and along the edge of the Salt Water Lake and other Swamps surrounding the Suburbs, having a height of three feet above the highest level of the highest Tide at Chandpaul Ghaut, is not merely unnecessary for the protection of the population of the Town of Calcutta and of the Suburbs, but that, under the circumstances speculated on by Mr. Wood, chiefly on extraordinary rise of Tide in the River Hoogly, the formation of the Embankment he has proposed could scarcely fail of producing the very effect it was intended to avert.

2nd. In the accompanying Sketch, A. represents the Bank of the River Hoogly; B. Mr. Wood's embankment, or Dam 3 feet higher than A.; C. the centre of the City of Calcutta, of which the *lowest quarter* is 7 feet *higher than the high water level of the Salt Water Lake E. F.*; A. C. D. Site of the city of Calcutta. Now in the case alluded to by Mr. Wood, that of an extreme Spring Tide or Inundation overflowing the River Bank at A., it is obvious that were there, as proposed by him, an Embankment at B. rising three feet higher than the Bank at A., its inevitable effect would be to Dam up the water overflowing

the Bank at A., and consequently to overwhelm the entire site of the city A. C. D. ; and although this effect might be in some degree retarded by the Sluices proposed to be introduced in the Embankment, yet it is evident that under the supposition of the whole River Bank being overflowed, these *Sluices* could but most imperfectly give vent to the water pouring into the City ; as further that although nominally made self-acting, they would speedily get choked up by the ruins of the mat and bamboo (straw or leaf thatched) huts constituting the habitations of the great proportion of the population of Calcutta. It in fact is clear, that under the circumstances described, the most effectual method of saving the lives of the inhabitants would be the total removal of the Embankment suggested as the means of their preservation, as this being done, the water overflowing the River Bank would uninterruptedly be able to discharge itself into the Salt Water Lake, which then having a surface of upwards of 40 square miles, and a still lower level of country extending 150 miles to the East-South-East of its Eastern side; would pass *harmlessly off to the ocean* any body of water that (barring a second Deluge) could ever overflow the River Bank.

3rd. With reference to a circumstance above adverted to, the fact of the lowest part of the City of *Calcutta* being upwards of 7 feet above high-water in the *Salt Water Lake*, I have (in a previous report addressed to you) pointed out the means by which (were funds available) the City might be effectually *cleaned and drained*; and I may here observe, that one of the causes of its being at present less perfectly drained, than it might be, is the construction of *Embanked Roads*, some of them running parallel to the line of Embankment proposed by Mr. Wood, and which, by interfering with the free discharge of rain water into the Salt Water Lake, dam it back into localities from which it is only raised by the slow and comparatively unhealthy process of evaporation.

4th. The same principle applies to the Embankment proposed by Mr. Wood around Garden Reach and its vicinity as to that recommended by him around Calcutta and its Suburbs ; in both localities the ground immediately adjacent to the River is drained *into it*, but in both the general fall of the surface of the country is from the River Bank to the East-South-Eastward, and of consequence in both cases, the formation of an Embankment necessarily acting as a Dam to interrupt the free discharge of water overflowing the River Bank, would in every respect be inexpedient.

5th. The self-acting Sluices described by Mr. Wood, (in paragraph 8th) as having been erected by Colonel Pearce at the lower end of Garden Reach for the discharge of the rain water falling in the grounds of the houses adjoining the River Bank, and in and around the neighbouring villages, appear *at present* not to be in use ; as at Spring Tide the water flows back from the River up the *ditches* on either side of the Garden Reach Road, and overflowing *these*, it in several cases lodges itself in localities, from which it only finds escape by the insalubrious agency of evaporation.

6th. These "self-acting Sluices" ought to be renewed, and made of such capacity, as to pass off during each Ebb Tide, all the rain water falling on the surface intended to be drained by them during the time they would be closed by the Flood Tide.

I have the honor to be,

Sir,

Your most obedient servant,

(Signed) W. N. FORBES,

Lieutenant Colonel, Engineers.

MINT,

17th October, 1843.

No. 35.

No. 2036.

To J. H. PATTON, ESQ.

Chief Magistrate, &c. &c. &c.

DEAR SIR,

Several propositions relative to New Laws for the better government of the Town of Calcutta were offered by Mr. McFarlan, then the Chief Magistrate, and were transmitted by the Government to the Indian Law Commission, who communicated their opinion regarding the propriety of passing them.

The Government took the letter of the Law Commission into consideration on the 7th February 1838; and upon all of the propositions, except two, the opinion of the Government of India was pronounced.

The two excepted propositions were, a Law for the regulation of Ferry boats plying between Calcutta and the opposite bank of the River, and a Law to prevent the obstruction of Public Ghauts by Boats remaining a long time in front of them. These two points were referred to the Committee of Municipal Improvements, of which you are a Member, for our opinion in regard to the necessity of the first proposed measure, and to the provisions of the Law which, if a Law be called for at all, ought to be enacted upon that matter, and also for the opinion of our Committee upon the 2nd of these proposed Laws relative to the obstructions at the Ghauts.

I am at present engaged in drawing a draft Report of our Committee upon all the matters which remain for us to report upon, of which, I am sorry to say, that very much through my negligence, and partly from my occupations, these two matters form a part.

I am desirous of obtaining first your opinion upon the necessity of any legal enactment in regard to both or either of these subjects.

Secondly, the grounds of your opinion.

Thirdly, your opinion on the sort of investigation which it would be right for the Committee to institute, in order to report upon these matters.

Fourthly, whether any old Bye-laws or Regulations exist, or any Laws have been passed since the date of the above Resolution regarding them; and,

Lastly, any other observation upon the subject with which you may think fit to favor me.

I have addressed you this letter, thinking that you may possibly prefer giving me your opinion in writing to stating it verbally at a Meeting of the Committee.

It is my intention to assemble the Committee as soon as possible after the close of the ensuing Criminal Sessions, which will probably be in about a fortnight; and if you prefer stating your opinion verbally to the Committee, it will equally answer my purpose, but I think the Committee must have the benefit of your opinion as Chief Magistrate, to enable them to report upon the questions, or to institute a suitable inquiry.

I have the honour to be,

Dear Sir,

Your most obedient and humble servant,

(Signed)

J. P. GRANT,

Chairman of the Committee upon Municipal Improvements.

See Addenda to
Appendix (F) to
the Municipal
Committee's Re-
port.

MUNICIPAL OFFICE,
12th June, 1845.

No. 36.

(No. 302.)

To THE HON'BLE SIR J. P. GRANT, Kt. M. A.

Chairman to the Committee upon Municipal Improvements, Calcutta.

HONORABLE SIR,

I have the honor to acknowledge the receipt of your letter of the 13th instant, requesting my opinion on certain points referred by Government for the consideration of the Committee of Municipal Improvements, relating to a proposed Law for the regulation of Ferry boats plying between Calcutta and the opposite bank of the River, and a Law to prevent the obstruction of public Ghauts by boats remaining a long time in front of them.

2nd. I shall proceed to make such observations as occur to me in the order observed in your letter.

1stly. With regard to the first subject, viz., the Regulation of Ferry boats, I am decidedly of opinion that a legal enactment is both proper and necessary.

2ndly. My reason for entertaining such an opinion, is the frequent accidents that occur on the River, attended in many cases with extensive loss of life, from the overloaded state of Ferry boats, their being ill provided with boat-gear, and the inefficient manner in which they are ordinarily manned; but the principal cause of these accidents is generally owing to their being overcrowded. The prevention of this evil seems to me to be the primary object that demands attention, and for this purpose it appears necessary that there should be particular Ghauts fixed for Ferry boats, and that these boats should be numbered and registered, together with the name of the owner. The capabilities of each boat, as regards the number of men it is calculated to hold with safety, should be carefully ascertained, and this number, as well as that of the register number, should be painted in legible characters in some conspicuous part of the boat.

3rdly. The sort of investigation which I think it would be proper to institute in order to report upon the questions referred to me, should be the oral examinations of those who frequent the River, and thus have opportunities of witnessing the accidents, that commonly occur, and might offer useful suggestions on the subject. Such persons, I presume, might be found in the Master Attendant's and Harbour Master's Departments, and among the Inspectors of Customs and the better class of Preventive Officers.

4thly. I am not aware of the existence of any old Bye-Laws or Regulations, or any Laws that have been passed since the date of the Resolutions of the Government you allude to, the 7th February 1838, that have reference to the matters in question.

5thly. Nothing further occurs to me at present worthy of suggestion. I shall be happy to assist the Committee in arranging the details of Registry and other matters connected with the proposed measure.

3rd. With reference to the obstruction of the public Ghauts, and the means of preventing it, I am of opinion that the proposed Law would be highly desirable, although it may be questionable whether the Government would consent to bear the expense that will be incidental to its efficient working. As regards the Ferry boats, the registry fees, however small, that it will be necessary to impose, will go to cover the expenses that the carrying out of the Law would entail; but as respects the proposed Law for the prevention of obstructions there can be no income, and the State will have to bear all charges of establishment, &c. that will be necessary for the purpose.

4th. At present no distinctions exist as to what Ghauts are public, and what are not. The whole face of the River as far as the Strand Road extends, is commonly used by the Public, and no question arises as regards the right of way.

I have the honour to be, Honorable Sir,

Your most obedient servant,

J. H. PATTON, *Chief Magistrate.*

CALCUTTA POLICE OFFICE,

26th June, 1845.

Extract—Military Board's Proceedings, 27th October 1835.

Summary of the Expense of constructing the Sunderbun Canal from its commencement in 1823-24 to 1st May 1835.

Year.	Purchase of Ground.	Excavation, embankments, earth work in general, clearing jungle, &c.	Dredging and deepening.	Masonry, bridges, drains.	Locks, lock gates, dams, wood-work.	Cleaning tow paths.	Establishment and contingencies.	Superintendent's salary.	Stores received from the Magazine.	Grand Total.
1823-4	31,162 6 6½	30,807 11 3	.... ..	.... ..	.... ..	7,778 12 7	11,000 0 0	1,448 11 0½	82,197 9 5
1824-5	18,395 0 0	564 6 11	.... ..	.... ..	.... ..	5,076 1 11	9,000 0 0	.... ..	33,035 8 10
1825-6	Work, ..	Suspended.	.... ..	.... ..	.... ..	.... ..	The establisht. for these years is	.... ..	.... ..	.... ..
1826-7	6,411 13 6½	2,674 2 10	.... ..	415 10 6½	.... ..	included in the	3,500 0 0	.... ..	13,001 10 10½
1827-8	29,621 8 8	15,640 15 0½	835 3 5	15,704 3 8½	.... ..	general charges	6,000 0 0	.... ..	67,801 14 5
1828-9	50,807 14 11½	13,504 3 8½	.... ..	1,711 13 7½	.... ..	of the Canal.	3,000 0 0	.... ..	69,024 0 3½
1829-30	30,930 1 2½	7,540 7 8	.... ..	.... ..	.... ..	324 11 2½	2,462 4 3½	.... ..	40,952 13 2
1830-31	2,818 14 7½	2,814 5 3	.... ..	.... ..	.... ..	715 0 2½	1,524 11 11½	.... ..	7,482 11 0½
1831-32	7,886 5 8	.... ..	.... ..	.... ..	.... ..	1,085 5 3	1,435 5 6	.... ..	10,036 11 4½
1832-33	95 6 0	.... ..	.... ..	1,316 9 9½	1,414 15 5½	.... ..	2,595 10 8½
1833-34	442 14 7	.... ..	.... ..	.... ..	.... ..	2,815 11 9½	861 3 3½	.... ..	2,620 11 8
1834-35	411 3 1½	.... ..	.... ..	.... ..	813 7 8	.... ..	861 3 3½	.... ..	4,501 9 10½
Total,	1,78,908 2 10	73,546 4 8½	930 9 5	17,831 11 5½	813 7 8	19,112 4 9	41,059 11 10	1,448 11 0½	3,33,650 15 8½

EDWD. SANDERS,

Officiating Secretary, Military Board.

No. 38.

Statement shewing the proportion of Establishment charges borne by the different branches of the Canals under the Superintendent of the Canals.

	Proportion of the charges.	The Superintendent's salary.	Permanent establishment.	Average of contingent charges.	Establishment specified for the locks.	Steam Dredger establishment.	Steam Dredger probable amount of repair and contingent charges.	Monthly Total.	Yearly Total.
Circular Canal, ..	$\frac{2}{10}$ 0 0	57 6 $\frac{4}{10}$	27 3 2 $\frac{4}{10}$	10 0 0	* 147 0 0	89 3 2 $\frac{4}{10}$	142 12 9 $\frac{6}{10}$	* 473 9 9 $\frac{8}{10}$	* 5,683 5 9 $\frac{6}{10}$
Baliaghata ditto, ..	$\frac{1}{10}$ 0 0	28 11 3 $\frac{7}{10}$	13 9 7 $\frac{2}{10}$	5 0 0	0 0 0	44 9 7 $\frac{2}{10}$	71 6 4 $\frac{8}{10}$	163 4 10 $\frac{9}{10}$	1,959 10 10 $\frac{8}{10}$
Entally ditto, ..	$\frac{1}{10}$ 0 0	28 11 3 $\frac{7}{10}$	13 9 7 $\frac{2}{10}$	5 0 0	0 0 0	44 9 7 $\frac{2}{10}$	71 6 4 $\frac{8}{10}$	163 4 10 $\frac{9}{10}$	1,959 10 10 $\frac{8}{10}$
Tolly's Nullah, ..	$\frac{2}{10}$ 0 0	57 6 7 $\frac{4}{10}$	27 3 2 $\frac{4}{10}$	10 0 0	0 0 0	89 3 2 $\frac{4}{10}$	142 12 9 $\frac{6}{10}$	326 9 9 $\frac{8}{10}$	3,919 5 9 $\frac{6}{10}$
Lake Channel, ..	$\frac{1}{10}$ 0 0	28 11 3 $\frac{7}{10}$	13 9 7 $\frac{2}{10}$	5 0 0	0 0 0	44 9 7 $\frac{2}{10}$	71 6 4 $\frac{8}{10}$	163 4 10 $\frac{9}{10}$	1,959 10 10 $\frac{8}{10}$
Sunderbun Canals,	$\frac{3}{10}$ 0 0	86 1 11 $\frac{1}{10}$	40 12 9 $\frac{6}{10}$	15 0 0	0 0 0	133 12 9 $\frac{6}{10}$	214 3 2 $\frac{4}{10}$	489 14 8 $\frac{7}{10}$	5,879 0 8 $\frac{4}{10}$
Monthly Totals,....	$\frac{10}{10}$ 0 0	† 287 1 1	135 0 0	50 0 0	147 0 0	446 0 0	714 0 0	1,780 1 1	.. .. .
Yearly ditto,	1 × 12 0 0	3,444 13 0	1,632 0 0	600 0 0	1,764 0 0	5,352 0 0	8,568 0 0		21,360 13 0

* The charge for the Locks, 147 Rs. monthly, or Rs. 1,764 annually, is included in the establishment maintained for the Circular Canal only, as the Locks are situate on that line; but as closing one end of the whole line of communication which reaps an equal advantage from their operation, the charge might perhaps be more fairly distributed on the Circular and Baliaghata Canals and Lake Channel.

† Half of Captain Thomson's salary, the other half being charged to the Iron Suspension Bridge Department.

EDWD. SANDEHS,

Secretary, Military Board.

*Summary of the Expense of Constructing the Circular Canal from its commencement in 1823-24 to
1st May, 1835.*

Years.	Purchase of ground.	Excavation, embankments, earth-work in general, clearing jungle, &c.	Dredging and deepening.	Masonry, bridges, drains.	Lock, Lock-gates, dam, and wood-work.	Road along the Canal.	Establishment & contingencies.	Superintendent's salary.	Cost of Iron work from Suspension Bridge Department.	Grand Total.
1823-4	91,774 0 0	...	...	...	...	...	...	...	...	91,774 0 0
1824-5	1,19,760 14 0	...	...	...	...	...	...	...	...	1,19,760 14 0
1825-6	22,172 8 0	...	...	...	...	...	...	...	...	22,172 8 0
1826-7	42,657 0 0	...	...	...	...	...	...	...	...	42,657 0 0
1827-8	89,925 13 10	...	...	...	...	...	...	...	...	89,925 13 10
1828-9	3,36,034 9 10	13,360 9 5½	...	...	...	...	Included in the general charges of excavation, &c.	6,000 0 0	...	4,05,395 3 3½
1829-30	45,169 3 9	69,156 3 4½	...	...	...	...	649 6 5	4,324 8 7½	20,107 2 11½	1,39,357 2 8½
1830-1	91,971 3 0	59,072 1 3	...	38,002 8 2½	...	3,450 14 9	1,430 0 5	3,049 7 11½	...	1,54,742 2 7½
1831-2	22,055 8 4	22,953 5 4½	...	10,092 15 3½	...	20,860 4 0	2,170 10 5½	2,870 11 0	...	1,19,592 1 11½
1832-3	40,023 1 7	8,291 13 3½	5,062 2 11	4,701 5 3½	...	6,779 7 1½	2,633 3 7	3,021 4 11	340 8 7	1,11,261 12 2½
1833-4	5,106 4 0	1,698 0 2½	5,893 13 10	6,667 1 8	...	13,550 1 7½	5,631 7 7	4,880 2 9	75 15 2	35,786 0 8½
1834-5	...	12,864 1 7	...	...	...	...	...	1,722 6 7	615 3 8	1,11,048 15 8½
	9,56,650 2 4	1,87,399 15 7½	10,956 0 9	59,463 14 5½	95,411 7 11	44,640 11 6	12,514 12 5½	26,468 9 10	49,968 0 2½	14,43,473 11 1½

EDWARD SANDERS,

Secretary, Military Board.

No. 40.

Statement of the Canal Committee's Office Establishment.

	Secretary's salary and office rent.	Office establishment & contingent charges.	Total of each year.
1822-23,	280 0 0	...	280 0 0
1823-24,	3,600 0 0	4,532 0 0	8,452 0 0
1824-25,	3,600 0 0	5,764 9 11	9,364 9 11
1825-26,	3,600 0 0	6,324 0 0	9,924 0 0
1826-27,	3,600 0 0	6,324 0 0	9,924 0 0
1827-28,	3,600 0 0	6,324 0 0	9,924 0 0
1828-29,	3,600 0 0	6,324 0 0	9,924 0 0
1829-30,	3,600 0 0	6,324 0 0	9,924 0 0
1830-31,	2,300 0 0	4,012 0 0	6,310 0 1
	27,780 0	46,248 10 0	74,028 10 0

EDWARD SANDERS,
Secretary, Military Board.

No. 42.

Table shewing the Number of Boats that have passed through the Circular Canal, during the undermentioned period.

Months.	Number of boats in 1833-4.	Number of boats in 1834-5.	Number of boats in 1835-6.	Total number of boats.
May, ....	....	737	1,230	1,967
June, ....	....	632	1,302	1,934
July,	733	764	....	1,497
August,	1,347	848	....	2,195
September,	1,297	968	....	2,265
October,	1,287	1,215	....	2,502
November,	1,441	955	....	2,396
December,	512	718	....	1,230
January, ..	....	1,378	....	1,378
February, ....	....	1,805	....	1,805
March,	142	1,575	....	1,717
April, ...	609	1,614	....	2,223
	7,368	13,209	2,532	23,109

EDWARD SANDERS,
Secretary, Military Board.

No. 43.

Statement of Rents collected by the Aumeen from Tenants occupying the surplus lands along the Circular Canal.

Collected in the year 1832-3,	....	....	....	....	....	....	....	....	....	1,318 9 4
Ditto ,, Ditto 1833-4,	....	....	....	....	....	....	....	....	....	912 0 0
Ditto ,, Ditto 1834-5,	....	....	....	....	....	....	....	....	....	1,326 14 2
Total Sicca Rupees,										3,557 7 6

EDWARD SANDERS,
Secretary, Military Board.

No. 44.

Extract—Military Board's Proceedings, 26th January 1844.

No. 125.

FROM THE MILITARY BOARD,

TO THE HONORABLE W. W. BIRD, ESQ.

Deputy Governor of Bengal.

Revenue Department.

HONORABLE SIR,

Fort William, 9th May, 1843.

Letter No. 32, of the 4th April last, from the Officiating Secretary Board of Revenue, with accompaniments.

Letter No. 1885, of the 23rd November last, from Lieutenant Colonel Garstin, with accompaniments.

With reference to Mr. Secretary Halliday's Letter, Nos. 1257 and 1258, both dated the 10th October 1842, we have the honor to submit the original papers noted on the margin, and also to append the following statements of the realizations made by Tolls on the Calcutta Canals and the Nuddea Rivers, during the periods mentioned therein, and the total expenditure incurred on these streams.

A.

Balleaghatta and Circular Canals and Tolly's Nullah.

Years.		Expenses for improving Navigation, &c. including Superintendent's salary and establishment.	Expenses on account of Toll collections.	Toll. Total Expenditure.	Gross Collections.	Surplus.
1804-5 to 1835-6, and from May to November, 1836.	{ As per Statement furnished by the Accountant General, through the Sudder Board of Revenue. }	90,870 11 3	2,45,421 11 8	3,36,292 6 11	27,22,721 6 5	23,86,428 15 6
1836-37 to 1841-42.	{ As per Statement prepared in the Board's Office. }	1,52,382 13 5	46,320 15 4	1,98,703 12 9	7,91,864 6 3	5,93,160 9 6
	Total amount Rs. ..	2,43,253 8 8	2,91,742 11 0	5,34,996 3 8	35,14,585 12 8	29,79,589 9 0

B.

Nuddea River.

Years.		Expenses for improving Navigation, &c. including Superintendent's salary and establishment.	Expenses on account of Toll collections.	Total Expenditure.	Gross Collections.	Surplus.
1824-25 to 1829-30.	{ As per Statement furnished by the Accountant General. }	2,13,342 10 11	1,04,076 15 3	3,17,419 10 2	5,70,120 3 0	2,52,700 8 10
1830-31 to 1839-40.	{ As per ditto, by Captain Smyth, vide Proceeding, 9th Feb. 1841. }	3,28,397 3 10	1,48,712 6 4	4,77,109 10 2	15,97,289 5 9	11,20,179 11 7
1840-41 and 1841-42. }	Ditto, ditto, ditto.	53,119 14 10	35,456 14 6	88,576 13 4	4,52,465 9 6	3,63,888 12 2
	Total amount Rs. ..	5,94,859 13 7	2,88,246 4 1	8,83,106 1 8	26,19,875 2 3	17,36,769 0 7

2nd. With regard to Statement A. we beg to observe, that the cost of excavating the Circular Canal and constructing Bridges, which is Rupees 14,43,473 : 11 : 1½, and the Sunderbund Canal, Rs. 3,33,650 : 15 : 8½, as well as that for Tolly's Nullah and the Balleahghatta Canal (which is not known to us), is not shewn in this Statement.

3rd. We propose to suspend our opinion on the subject of changes in the rules for collecting Tolls on the Nuddea Rivers, until Captain Smyth shall have furnished us with a Report on the subject, as promised in the 10th Paragraph of his Letter, No. dated the 27th March last, an Extract of which is hereunto annexed.

We have, &c.

(Signed) J. H. PATTON, *Chief Magistrate.*

REVENUE DEPARTMENT, „ J. CHEAPE, *Lieut.-Colonel, Chief Engineers.*

FORT WILLIAM, „ T. M. TAYLOR, *Lieutenant-Colonel.*

9th May, 1843. „ A. IRVINE, *Major.*

No. 44. a.

No. 32.

FROM THE OFFICIATING SECRETARY, SUDDER BOARD OF REVENUE,
TO THE SECRETARY TO THE MILITARY BOARD.

SIR,

In continuation of Letter, No. 12, dated the 24th January last, I am directed by the Sudder Board of Revenue to transmit herewith* four original Statements, prepared in the Office of the Accountant General, conveying the particulars called for in your Letters, Nos. 3739 and 3740, both dated 24th October last.

I have the honor to be,

Sir,

Your most obedient servant,

(Signed) GEO. PLOWDEN,
Officiating Secretary.

SUDDER BOARD OF REVENUE,
FORT WILLIAM,
The 4th April, 1843.

No. 33.
Miscellaneous Department, Present,
J. Lewis, Esq.

*Marked No. 41. a.
No. 44. a.(1) to
No. 44. a.(4) inclusive.—J. M.

Copied by G. R.

Compared, W. PALMER.

No. 44. *u.*⁽¹⁾

Statement of Collections and Expenditure on the Balliaghatta New Canal, from the year 1810-11 to 1835-36, and from May to Nov. 1836.

	Expenses for improving the navigation, including the Superintendent's salary and establishment.	Expenses on account of Toll Collections.	Total Expenditure.	Gross Collections.	Surplus.
1810-11, ....	.....	862 6 5	862 6 5	2,902 0 0	2,039 9 7
1811-12, ....	.....	1,729 1 7	1,729 1 7	6,075 0 0	4,345 14 5
1812-13,	620 7 4	1,863 12 0	2,484 3 4	11,394 11 8	8,910 8 4
1813-14,	59 4 3	2,051 11 9	2,111 0 0	11,435 14 5	9,324 14 5
1814-15,	542 4 0	2,540 8 2	3,082 12 2	12,237 0 0	9,154 3 10
1815-16, ....	.....	2,129 4 0	2,129 4 0	13,071 0 0	10,941 12 0
1816-17,	700 0 0	2,160 3 5	2,860 3 5	14,633 11 7	11,773 8 2
1817-18, ....	.....	2,210 5 6	2,210 5 6	15,963 13 0	13,753 7 6
1818-19, ....	.....	2,164 11 0	2,164 11 0	17,191 11 5	15,027 0 5
1819-20,	796 0 0	2,310 10 9	3,106 10 9	18,107 15 5	15,001 4 8
1820-21, ....	.....	2,302 0 11	2,302 0 11	17,686 4 4	15,384 3 5
1821-22,	874 6 0	2,282 9 4	3,156 15 4	17,674 12 5	14,517 13 1
1822-23, ....	.....	2,281 0 3	2,281 0 3	17,622 6 9	15,341 6 6
1823-24, ....	.....	2,277 11 9	2,277 11 9	16,546 12 11	14,269 1 2
1824-25, ....	.....	2,225 12 11	2,225 12 11	16,896 12 1	14,670 15 2
1825-26, ....	.....	2,255 8 3	2,255 8 3	17,115 8 0	14,859 15 9
1826-27, ....	.....	2,192 12 9	2,192 12 9	14,803 14 2	12,611 1 5
1827-28, ....	.....	2,200 7 9	2,200 7 9	17,002 1 5	14,801 9 8
1828-29, ....	.....	2,256 12 7	2,256 12 7	17,141 10 10	14,884 14 3
1829-30, ....	.....	2,267 2 4	2,267 2 4	17,322 4 11	15,055 2 7
1830-31,	150 0 0	2,272 7 1	2,422 7 1	17,503 13 3	15,081 6 2
1831-32, ....	.....	2,262 2 3	2,262 2 3	17,544 2 6	15,282 0 3
1832-33, ....	.....	2,331 15 0	2,331 15 0	18,083 4 11	1,575 1 5 11
1833-34, ....	.....	2,394 5 0	2,394 5 0	18,287 14 3	15,893 9 3
1834-35,	510 0 0	2,429 4 7	2,939 4 7	19,354 4 10	16,415 0 3
1835-36, ....	.....	2,364 0 5	2,364 0 5	25,841 12 5	23,477 12 0
From May to November, 1836. ....	.....	2,196 10 8	2,196 10 8	19,402 2 9	17,205 8 1

FORT WILLIAM,
ACCOUNTANT GENERAL'S OFFICE,
REVENUE DEPARTMENT,
The 4th April, 1843.

(Signed) FRED. EDWARD PORTEOUS,
Officiating H. A.
Examined, NUBOKISSEN SEAT.

Errors Excepted,
(Signed) C. MORLEY,
Accountant General.

No. 44. a. ⁽²⁾

*Statement of Collections and Expenditure on Tolly's Nullah, from the
year 1804-5 to 1835-36, and from May to November, 1836.*

	Expenses for im- proving the navi- gation, including the Superinten- dent's salary and establishment.	Expenses on ac- count of Toll Col- lections.	Total Expenditure.	Gross Collections.	Surplus.
1804-5, .....	.....	2,432 2 1	2,432 2 1	48,490 9 7	46,058 7 6
1805-6, .....	.....	3,104 0 0	3,104 0 0	37,658 15 8	34,554 15 8
1806-7, .....	.....	2,542 0 0	2,542 0 0	60,063 4 0	57,521 4 0
1807-8,	61,650 2 2	3,708 0 0	65,358 2 2	69,762 0 0	4,403 13 10
1808-9, .....	.....	3,708 0 0	3,708 0 0	73,874 6 4	70,166 6 4
1809-10, .....	.....	3,708 0 0	3,708 0 0	78,700 8 4	74,992 8 4
1810-11, .....	.....	3,708 0 0	3,708 0 0	71,683 15 0	67,975 15 0
1811-12, .....	.....	3,708 0 0	3,708 0 0	60,299 14 0	56,591 14 0
1812-13, .....	.....	3,708 0 0	3,708 0 0	66,023 0 0	62,315 0 0
1813-14, .....	.....	4,883 14 8	4,883 14 8	62,885 2 0	58,001 3 4
1814-15,	114 0 0	9,224 15 0	9,338 15 0	64,795 0 0	55,456 1 0
1815-16,	228 0 0	6,910 5 7	7,138 5 7	63,422 1 5	56,283 11 10
1816-17,	494 0 0	6,817 10 1	7,311 10 1	67,211 13 9	59,900 3 8
1817-18,	570 0 0	6,673 15 2	7,243 15 2	72,425 6 2	65,181 7 0
1818-19,	806 0 0	6,899 13 3	7,705 13 3	89,596 15 6	81,891 2 3
1819-20,	370 0 0	7,844 2 5	8,214 2 5	88,401 8 6	80,187 6 1
1820-21,	2,238 7 8	7,382 12 10	9,621 4 6	78,495 6 3	68,874 1 9
1821-22,	456 0 0	6,991 0 3	7,447 0 3	76,010 13 11	68,563 13 8
1822-23,	10,965 13 0	6,511 10 11	17,477 7 11	67,739 2 6	50,261 10 7
1823-24,	1,063 10 10	6,412 2 11	7,475 13 9	67,351 13 3	59,875 15 6
1824-25, .....	.....	6,529 10 8	6,529 10 8	68,708 15 1	62,179 4 5
1825-26, .....	.....	6,722 0 1	6,722 0 1	81,259 13 7	74,537 13 6
1826-27, .....	.....	7,262 11 8	7,262 11 8	83,593 0 1	76,330 4 5
1827-28, .....	.....	7,295 12 5	7,295 12 5	83,932 4 3	76,636 7 10
1828-29, .....	.....	6,974 7 0	6,974 7 0	81,589 4 6	74,614 13 6
1829-30, .....	.....	7,057 14 7	7,057 14 7	66,416 15 10	59,359 1 3
1830-31, .....	.....	6,426 1 10	6,426 1 10	65,812 13 6	59,386 11 8
1831-32, .....	.....	6,166 5 11	6,166 5 11	66,424 8 6	60,258 2 7
1832-33, .....	.....	6,314 9 0	6,314 9 0	66,523 15 6	60,209 6 6
1833-34, .....	.....	6,436 15 4	6,436 13 4	66,815 12 6	60,378 13 2
1834-35,	95 12 0	6,607 6 3	6,703 2 3	70,386 9 6	63,683 7 3
1835-36,	450 6 0	5,684 4 6	6,134 10 6	61,789 5 1	55,654 10 7
From May to No- vember, 1836.....	.....	249 8 10	249 8 10	46,875 9 8	46,626 0 10

FORT WILLIAM,
ACCOUNTANT GENERAL'S OFFICE,
REVENUE DEPARTMENT,
The 4th April, 1843.

(Signed) FRED. EDWARD PORTEOUS,
Officiating H. A.
Examined, NUBOKISSEN SEAT.

Errors Excepted,
(Signed) C. MORLEY,
Accountant General.

No. 44. a.⁽³⁾

No. 34.

Statement of Collections and Expenditure on the Eastern or Circular Canal, from the year 1830-31 to 1835-36, and from May to Nov. 1836.

	Expenses for improving the navigation, including the Superintendent's salary and establishment.	Expenses on account of the Toll Collections.	Total Expenditure.	Gross Collections.	Surplus.
1831-32,	393 5 0	393 5 0
1832-33,	755 6 1	755 6 1
1833-34,	886 4 10	886 4 10
1834-35,	2,558 12 0	2,558 12 0
1835-36,	7,116 2 0	.....	7,116 2 0	3,931 7 11	Excess charges. 3,184 10 1
From May to November 1836.....	10,333 10 7	10,333 10 7

FORT WILLIAM,
ACCOUNTANT GENERAL'S OFFICE,
REVENUE DEPARTMENT,
The 4th April, 1843.

Errors Excepted,
(Signed) C. MORLEY,
Accountant General.

No. 44. a.⁽⁴⁾

No. 35.

Statement of Collections and Expenditure on the Nuddea Rivers, from the year 1824-25 to 1829-30, and for May 1830.

	Expenses for improving the navigation, including the Superintendent's salary and establishment.	Expenses on account of Toll Collections.	Total Expenditure.	Gross Collections.	Surplus.
1824-25,	445 7 6	16,161 7 6	16,606 8 9	3,518 10 0	13,087 14 9
1825-26,	44,333 10 6	8,366 10 3	52,700 4 9	68,625 13 6	15,925 8 9
1826-27,	29,839 3 5	14,236 2 1	44,075 5 6	1,10,727 7 4	66,652 1 10
1827-28,	35,786 10 11	13,868 3 4	49,654 14 3	1,15,779 0 11	66,124 2 8
1828-29,	13,295 0 0	39,303 4 8	52,598 4 8	1,29,025 6 10	76,427 2 2
1829-30,	89,642 10 7	12,141 9 8	1,01,784 4 3	1,42,443 12 5	40,669 8 2
May 1830, ..	3,303 8 0	473 6 9	3,776 14 9	4,705 9 11	928 11 2

FORT WILLIAM,
ACCOUNTANT GENERAL'S OFFICE,
REVENUE DEPARTMENT,
The 4th April, 1843.

Errors Excepted,
(Signed) C. MORLEY,
Accountant General.

No. 44. b.

No. 1885.

FROM LIEUTENANT-COLONEL E. GARSTIN,
Superintending Engineer, L. P.

TO MAJOR H. DEBUDE,
Secretary, Military Board.

SIR,

Agreeably to the instructions conveyed in your Letter, No. 3741, of the 24th October 1842, I have the honor to enclose a Statement of the Collections and Expenditure on the Nuddea Rivers, from the 1st May 1840 to the 30th April 1842, accompanied by an original Letter, No. 254, of the 15th November instant, from the Superintendent, Captain W. M. Smyth, on the subject.

Tolls.

2nd. As I have in my Letter, No. 1884, of this date, recommended a revision of the manner of levying the Tolls, and regulations regarding them, it is unnecessary to say any thing on the subject here.

3rd. In regard to Captain Smyth's suggested Canal, I can say nothing until the question shall be submitted, with Plans, Sections and Estimates; for even if feasible at present, according to his showing doubtful, it might not, for other reasons, be advisable.

I have the honor to be,

Sir,

Your obedient servant,

BARRACKPORE,
23rd November, 1842.

(Signed) E. GARSTIN, *Lieut. Colonel,*
Superintending Engineer, L. P.

No. 44. b. ⁽¹⁾

No. 254.

LIEUTENANT-COLONEL E. GARSTIN,
Superintending Engineer, L. P.

SIR,

I have the honor to enclose the Statement called for in your Letter, No. 1585, of the 26th ultimo, and I trust that the result shown may be deemed satisfactory.

2nd. There is a surplus of receipts over expenditure in the last two years, which amounts to Rupees 3,63,888: 12: 13½, and it is to be expected that this surplus, though it will fluctuate with the traffic of the country, will not be less than 1,50,000 Rupees per annum, whilst, on the other hand, it may increase considerably.

3rd. Upon the subject of this Toll, I would remark, that the amount collected upon the Bhaugiruttee has increased three-fold since 1824, when it was established—notwithstanding two reductions in the rates, the first (published in the Government Gazette of the 15th January 1834,) was on Bamboos and Timbers; the second (published on the 6th September 1837,) was a general reduction of 25 per cent. upon all Tolls leviable.

4th. The great increase in the receipts tends to prove, that the impost which indeed falls very lightly upon Merchandize, has not been prejudicial to traffic, whilst the charge for collection under the present system is only 8 per cent., as will be seen by an inspection of the statement now submitted.

5th. The reduction of 1834, extended to the Jellinghee and Matabanga Rivers; the further reduction of 25 per cent. was confined to the Bhaugiruttee; and it is due to Mr. Larruleta, the present Collector on the Bhaugiruttee, to remark, that under his management the receipts from the Toll increased so considerably as to induce the reduction to the Jellinghee and Matabanga Rivers—it ought to be ascertained whether it might not be made so as to facilitate the measurements and calculations.

6th. On the subject of improvement to the Navigation, I would remark, that the sum expended, as shown in the statement, may be considered as a minimum, having been limited to the construction of Bandahls for contracting the Stream, to the removing of trees and other obstructions from the bed and banks of the Rivers, and maintaining an establishment to superintend these works, necessarily extensive, as it requires to be so posted that within a few days, work can be commenced on any point, on a line of 400 miles of River.

7th. The works may, I think, be considered successful on the whole, for the Bhaugiruttee remained navigable throughout the two past years for Boats drawing three feet of water, although the Jellinghee and Matabangah were closed from March.

8th. The Jellinghee closed sooner last year than the previous one, and I had intentionally limited the works; it is only by means of actual experiments that a confident opinion can be given of the success or otherwise which attend the endeavours to improve the navigation.

9th. The River Matabangah is always obstructed by shoals for about 16 miles, viz. from Boleah, where the waters flow off down the Pangassee to Katchikatta. The distance in a direct line is only $6\frac{3}{4}$ miles. An attempt made last year at a small expense of Rs. 287: 2: 6 to turn the water from the Pangassee down the Matabangah failed, as I apprehended that it would, and that attempts on a larger scale would have done likewise. But it might be possible to keep open the communication on this part of the River for Boats of 5 or 600 maunds, by a Canal cut from the Matabangah above the entrance of the Pangassee, (and the shoals formed as above mentioned), the Canal to rejoin the main Channels in deep water below the shoals. After obtaining data, I shall submit the subject for further consideration; I may however describe the rough design. I should propose to give the least possible fall to the Canal, and to keep up its level at the terminus from 6 to 8 feet above the water in the Matabangah, into which River the vessels must pass over a dam, so to speak, on an inclined railway, riding on a car or upon rollers; the flat bottom of all Country Boats making this practicable. The Canal to be closed in the rains. The objections to the undertaking are many. The difficulty of digging a Canal in the loose soil to be met with, and the tendency it will have to fill up, both by the deposit carried in the water, and by the soil that will constantly exude from the sides?—The Canal could not be scoured, and would require to be cleared out every year by manual labour or by Dredging Boats. It is questionable whether, with a small fall, sufficient water would be supplied from the River to provide for the great leakage.

10th. If any general improvement, such as that now referred to, could be undertaken with a chance of success, the Tolls on the present scale supply ample funds.

I have the honor to be,

Sir,

Your most obedient servant,

JUNGYPORE,
15th November, 1842.

(Signed) WILLIAM M. SMYTH, Captain, Engineers,
Superintendent Nuddeah Rivers.

No. 44. *b.*⁽¹⁴⁾*Abstract of the Letter.*

- PARA. 1. Encloses statement called for in Letter, No. 1585, of the 26th October 1842.
- „ 2. States probable fluctuation of Tolls, with the Traffic.
- „ 3. The amount collected in the Bhagiruttee has increased three-fold, notwithstanding two reductions.
- „ 4. Increase tends to prove, that the Tolls do not check traffic, whilst the charge for collection is small.
- „ 5. The reduction of 1834, only extended to the Jellinghee and Matabangah. If it be proposed to extend that of 1837, it ought to be considered whether calculations could not be facilitated.
- „ 6. Expende for improvements may be considered a minimum.
- „ 7. Considered on the whole successful.
- „ 8. Jellinghee closed sooner last year. Works limited for the sake of experiment.
- „ 9. Portion of Matabangah that is obstructed, a rough project for a short Canal.
- „ 10. Ample funds for such improvements, if any could be undertaken with chance of success.

No. 44. *b.*⁽¹⁴⁾

Statement of Collections and Expenditure on the Nuddeah Rivers, from the 1st May 1840, to the 30th April 1842.

	Expense for improving Navigation, &c. including Superintendent's salary and establishment.	Expense on account of Toll Collections.	Total Expenditure.	Gross Collections.	Surplus.
From 1st May 1840, to 30th April 1841.	24,693 5 8½	17,212 1 2	41,905 6 10½	2,22,959 1 11	1,81,053 11 ¾
From 1st May 1841, to 30th April 1842.	28,426 9 2	18,244 13 4	46,671 6 6	2,29,506 7 7	1,82,835 1 1
	53,119 14 10½	35,456 14 6	88,576 13 4½	4,52,465 9 6	3,63,888.12 1½

(Signed) W. M. SMYTH, Captain, Engineers,
Superintendent Nuddeah Rivers.

No. 44. *c.*

The following Abstract Statements [marked A. and B. compiled in the Military Board's Office] shew the Collections and Expenditure on the Balleaghatta and Circular Canals, Tolly's Nullah, and Nuddea Rivers.

A.

Balleaghatta and Circular Canals and Tolly's Nullah.

Years.		Expense for im- proving Naviga- tion, &c. including Superintendent's salary and esta- blishments.	Expenses on account of Toll Collections.	Total Expenditure.	Gross Collections.	Surplus.
1836-7 | 1804-5 to 1835-36 to 1841-42.	As per Statements furnished by the Accountant Gen- eral, through the Sudder Board of Revenue.	90,870 11 3	2,45,421 11 8	3,36,292 6 11	2,722,721 6 5	2,386,428 15 6
	As per Statement prepared in the Board's Office.	1,52,382 13 5	46,320 15 4	1,98,703 12 9	7,91,864 6 3	5,93,160 9 6
	Total Amount Rs.	2,43,253 8 8	2,91,742 11 0	5,34,996 3 8	3,514,585 12 8	2,979,589 9 0

The expenses for constructing Houses for Toll Darogahs, New Dock at Balleaghatta, Tow-path and Roads, &c. on the banks of the Canals, and all other charges connected with the Canals, have been included in the item of expenditure of Rupees 152,382:13:5, as per Bills passed through this Office during the years from 1836-37 to 1841-42. The total expenditure of the New Circular Canals, &c. is not included in the above statement; but the total cost of the whole from the commencement, up to the 1st May 1835, stands thus as per statement, recorded in the Board's Proceedings of the 27th October 1835; viz.

Circular Canal with Iron Bridges, Lock, Gate, Superintendent's						
Salary, Establishment, and the purchase of Ground, &c.	..	14,43,473	11	1½		
Sunderbun Canal, ... ..	.	3,33,653	15	8½		

No. 44. d.

B.

Nuddea Rivers.

Years.		Expenses for improving Navigation, &c. including Superintendent's salary and establishment.	Expenses on account of Toll Collections.	Total Expenditure.	Gross Collections.	Surplus.
1824-25 to 1829-30	{ As per Statement furnished by the Accountant General. .. }	21,342 10 11	1,04,076 15 3	3,17,419 10 2	5,70,120 3 0	2,52,700 8 10
1830-31 to 1839-40	{ As per Do. by Captain Smyth, vide Proceedings 9th Feb. 1841. }	3,28,397 3 10	1,48,712 6 4	4,77,109 10 2	15,97,289 5 9	11,20,179 11 7
1840-41 and 1841-42	Ditto do. ditto.	53,119 14 10	35,456 14 6	88,576 13 4	4,52,465 9 6	3,63,888 12 2
	Total amount } Rupees, .. }	5,94,859 13 7	2,88,246 4 1	8,83,106 1 8	26,19,875 2 3	17,36,769 0 7

No. 45.

No. 706.

FROM UNDER-SECRETARY TO THE GOVERNMENT OF BENGAL,
TO THE MILITARY BOARD.

Revenue Department.

GENTLEMEN,

Fort William, 10th July, 1843.

I have the honor, by direction of the Deputy Governor, to acknowledge the receipt of your Letters, No. 125, dated 9th May last, and No. 1095, dated the 15th ultimo, with their respective enclosures, and to inform your Board in reply, that his Honor is pleased to sanction, as regards Boats of traffic only, the introduction of the mode of measurement in force in the Calcutta Canals, under the Notification of the 28th November 1839, on the Nuddea Rivers; and to extend the provisions of the Order of the 16th May 1837, to the Matabhanga and Jellinghee.

2nd. I am desired to draw your Board's attention to the large surplus (amounting to Rs. 17,36,769) now available for facilitating the Navigation of these Rivers, and to request that you will consider and suggest what may be the most advantageous mode of applying the whole, or any part of this sum for the benefit of the public, as contemplated by the Law of 1824.

3rd. In regard to the Calcutta Canals, I am directed to observe, that until allowance has been made for the expense of the public works [alluded to in the 2nd Para. of your Board's Letter of the 9th May, the actual surplus available on the 30th April 1842, cannot be known, and your Board are accordingly requested to furnish further information on that subject.

4th. But as the existence of a very considerable surplus of these Toll Collections cannot, after making every allowance, be doubtful, your Board are requested to offer such suggestions for the beneficial disposal of these funds also, as may seem called for, and at the same time state whether in the opinion of your Board, it would be advisable to make any further reduction in the Tolls levied on the Calcutta Canals, corresponding with that now sanctioned in those of the Rivers.

5th. His Honor, before taking into consideration the question of Dr. Fuller's allowances, is desirous of learning the effect thereupon of the present arrangements. The instructions proposed to be given to Captain Smyth in the 7th Para. of your Board's Letter of the 15th ultimo, have his Honor's approval.

I have the honor to be,

Gentlemen,

Your most obedient servant,

(Signed) CECIL BEADON,

Under Secretary to the Government of Bengal.

P. S.—The enclosures of your Letter are herewith returned, copies having been kept for record.

No 46.

No. 2087.

TO THE SUPERINTENDING ENGINEER, L. P.

27th July, 1843.

SIR,

With reference to your Letter, No. 1885 of the 23rd November last, and Capt. Smyth's Letters, Nos. 438 and 11 of the 29th April, and 15th May last, I am directed by the Military Board to annex Extract Paras. 1 and 5, of a Letter, No. 706, of the 10th instant, from Mr. Under-Secretary Beadon, communicating the sanction of Government to the introduction, as regards Boats of traffic only, of the mode of measurement in force in the Calcutta Canals, under the Notification of the 28th November 1839, on the Nuddea Rivers; and to extend the provisions of the Order of the 16th May 1837, to the Matabhanga and Jellinghee Rivers.

2nd. The Board request you will, with advertence to the 5th Para. of Mr. Beadon's Letter, desire Captain Smyth to insert a notification in the public papers of the changes authorized, for the information of the public, both in the Native and English language.

I have, &c.

(Signed) H. DEBUDE,

Secretary, Military Board.

No. 47.

No. 2088.

TO THE ACCOUNTANT GENERAL, DEPARTMENT OF PUBLIC WORKS.

SIR,

I am directed by the Military Board to transmit the enclosed* Statements prepared in your Office for the Sudder Board of Revenue, and an Extract, paragraph 3rd, from Mr. Under-Secretary Beadon's Letter, No. 706, of the 10th instant, together with the paragraph alluded to therein, and, with reference to the requisition of Government for further information, to request a supplementary Statement (as far as obtainable) of the original cost of the Excavation of the Balleahghatta Canal, and the Tolly's Nullah, and of the Tolls realized since they came into use, down to the periods already furnished, together with a statement of expense incurred on account of Toll collections.

I have, &c.

MILITARY BOARD OFFICE,
27th July, 1843.

(Signed) H. DEBUDE, Major,
Secretary, Military Board.

No. 47. a.

Extract from Mr. BEADON'S Letter, No. 706, dated 10th July, 1843.

Para. 3rd.—In regard to the Calcutta Canals, I am directed to observe, that until allowance has been made for the expense of the public works alluded to in the 2nd Para. of your Board's Letter of the 9th May, the actual surplus available of the 30th April 1842, cannot be known, and your Board are accordingly requested to furnish further information on that subject.

No. 47. b.

Extract from Military Board's Letter, No. 125, dated 9th May, 1843.

Para. 2nd.—With regard to Statement A, we beg to observe, that the cost of excavating the Circular Canal and constructing Bridges, which is Rupees 14,43,473:11:1½ and the Sunderbund Canal, Rupees 3,33,650-15-8½, as well as that for Tolly's Nullah and the Balleahghatta Canal (which is not known to us) is not shown in this Statement.

No. 48.

No. 6110.

FROM THE MILITARY BOARD,
TO THE HONORABLE W. W. BIRD, ESQ.
Deputy Governor of Bengal.

Revenue Department.

Fort William, 26th January, 1844.

HONORABLE SIR,

We have now the honor to address your Honor in continuation of our Letter, No. 4545, of the 10th November last, and especially with reference to the 2nd Para. thereof, regarding the most advantageous mode of applying the whole or a portion of the surplus collections from the Nuddeah Rivers and Calcutta Canals, as requested in Mr. Under-Secretary Beadon's Letter, No. 706, of the 10th January last.

2nd. We have not yet been furnished with the information called for from the Accountant General's Office regarding the exact cost of the Circular and Balliaghatta Canals and Tolly's Nullah. But we informed Government on the 27th October 1835, that the total cost of the Circular Canal was 14,80,408 Rupees. Tolly's Nullah having been undertaken as a private speculation, has probably cost the State nothing.

Regarding the Balliaghatta Canal, we have unfortunately no information whatever; but if the cost be unknown, so likewise is the amount of collections, a portion of which would have to be accounted for. For the present, and pending further information, it will not perhaps be unfair to omit both these items, and then if the known outlay on the Circular Canal be alone considered, the clear available surplus collection would stand thus:

Surplus collection in Balliaghatta and Circular Canals, and Tolly's									
Nullah,	..	..	..	..	..	..	..	..	29,79,589 9 0
Nuddea Rivers,	..	..	..	..	..	..	..	..	17,36,769 0 7
									47,16,358 9 7
Deduct outlay on Circular Canal,	..	..	..	..	..	..	..	..	14,80,408 0 0
Total Rs.									32,35,950 9 7

3rd. The points on which we are instructed to report are—first, as to the disposal of the surplus already accumulated; and secondly, the expediency of a further reduction of the Tolls; but as we have reason to believe the latter measure may be closely connected with the determination of the Government on the former, we proceed to offer our observations on the first point.

4th. The peculiar character of the Nuddeah Rivers, which renders the adoption of any extensive means for permanently improving their Navigation wholly impracticable, is well known to Government; but the importance of facilitating, by every possible means, the traffic through the Rivers is so great, that whatever with this view can be attempted with a reasonable prospect of success, should be undertaken. On this subject we sincerely regret to add, that the fickleness and uncertainty of the Channels of these Rivers is only confirmed by the experience of every succeeding year, and judging from the frequent and loud complaints which have been recently, and during the past year, preferred by, and through, the Chamber of Commerce, we fear the Channels have lately been, and now are, as impracticable as they have ever been known to be.

Regarding the most advantageous mode of applying the whole or a portion of the surplus collections from the Nuddea rivers and Calcutta Canals.

5th. We know not how we can better express, or more strongly support our own opinion regarding those Rivers, than by quoting at length Paras. 132 and 133, of the Printed Report, dated 29th November 1831, prepared by the Committee directed to report on this very subject, consisting of Colonel McLeod of Engineers, Captain (now Lieut.-Colonel) Forbes, and Mr. May, for many years Superintendent of the Nuddea Rivers.

“ Although we are not aware of any mode by which the impediments which annually present themselves to the free Navigation of the Nuddea Rivers can be permanently overcome or guarded against, experience having proved that the changes which take place in the course of the great River in one season (and which must necessarily more or less influence the Navigation of all rivers branching from it,) afford no data to determine what the next may produce; nevertheless, we do conceive it to be an object of the utmost importance, that so long as the waters of the Ganges will flow into any one of their channels, measures should be adopted so to conduct them through that Channel, as to secure the greatest depth for the longest possible period of the year.

“ In the absence therefore of a regular locked Canal, calculated to act in lieu of the Nuddea Rivers in the eight dry months, we would beg most respectfully to recommend, that not only should the measures hitherto taken with the view of facilitating the Navigation of the Jellinghee be persevered in, but that every additional means affording a reasonable prospect of promoting this object, should be resorted to.”

6th. Seeing, therefore, that any permanent improvement of the Navigation is impracticable, and that all the ordinary and temporary measures adopted with the same view have so little benefited the Trade, we beg very respectfully to submit our opinion on the subject of the formation of a new and artificial line of water-carriage in supersession of that by the Nuddea Rivers—we refer of course to the Rajmahl Canal.

7th. As the practicability of this work has been, as we conceive, carefully considered, and its details of execution, cost, and probable returns have been fully entered into in the Report above referred to, and in a subsequent Report of the same Committee, dated 15th February 1841, we have only to refer your Honor for particular information on these several points to the Report in question; but we beg to submit a few general remarks on the project.

8th. The Canal is proposed to be excavated between the (comparatively) deep water at the head of the Delta of the Ganges at Rajmahl and the deep water in the Mirzapore Creek, above the entrance of the latter into the Hooghly; the Canal would be 130 miles long, having a breadth of 50 feet at bottom, and carrying at the lowest depth 5 feet water. Its cost, including locks, stop gates, dam bridges, and outlets, and 20 per cent. for contingencies, is calculated to be 38,47,437 Rupees. The advantages to be drawn from it, independently of its being permanently Navigable, are very important. First, boats proceeding through it would reach Rajmahl, on the great River, by traversing a distance of 202 miles, instead of 528 miles as by the Soonderbund route, thus saving 326 miles in distance, and from 15 to 20 days in time. Secondly, it would closely approach, and give great additional value to two of the richest mineral fields in India, now comparatively inaccessible. Some of the richest iron ores, at present utterly neglected, though lying so close to Calcutta, will be approached by the line of the Canal, and Capitalists offered the means of working them to greater profit and with more ready returns, the practical difficulty hitherto having been the want of navigable streams or easily passable roads. Thirdly, as regards coals, the Canal would approach to within 30 miles of the regularly worked Coal fields, and this distance might be reduced to about 15 miles by means of a navigable branch of the Adjie, and thus the present circuitous route by the Damooda (often only available for five or six weeks in the year) might be abandoned. This advantage can hardly be over-estimated, when the rapidly increasing demand for coals in Calcutta is considered.

9th. And we must only allude in addition to the above advantages to the facilities the Canal would afford for irrigation, which again would be materially enhanced in importance by the admirable water-carriage to Calcutta, or the best market which the Canal would afford for the produce raised by its own waters, and to the variety of building materials which would become accessible, to feel assured that the importance and utility of the work must be at once admitted.

10th. The income from it, it is calculated, will amount to 5,80,000 Rupees per annum, or $14\frac{1}{2}$ per cent. on the gross expenditure, estimated at 40 lacks, (See Para. 54 of Report, dated 15th February 1841,) to be raised by a Toll of 2 Rs. per 100 maunds, on all boats passing through the Canal. On this head we have only to observe, that the calculations appear based on safe data, and the per centage is amply large to cover all the incidental expenses of repairs and establishments, and still leave a considerable surplus.

11th. Such are the general features of the project, and the advantages so great, that we trust we shall be justified in strongly recommending the work to the favourable consideration of Government. We may be permitted to add, that the question will now be considered by Government under circumstances very different from those which obtained on the date of the First Printed Report, (28th February 1831) inasmuch as the chief objection which could at that period have been urged against it, viz., the necessity for a heavy disbursement, in the first instance to be drawn from the public resources, now no longer exist, the actual surplus as exhibited in Para. 2, the subsequent collections up to this date (not considered in the above item,) and the continuance of the existing Tolls, or even a much lighter tax, on the Nuddea Rivers and Calcutta Canals until the opening of the great Canal, would, without trenching in the least on the resources of the State, furnish funds more than sufficient for the purpose.

12th. The outlay of the accumulated surplus on such a work seems to us quite legitimate. These funds have been raised by a tax on the Inland trade of Calcutta, and the Canal would be for the benefit and encouragement of that trade, and we conceive such a work would be highly acceptable to the Mercantile community.

13th. The Reports, Plans, &c. are not officially before our Board, but that a very valuable mass of information has been obtained, may be readily gathered from a perusal of the Printed Reports, and the intimation therein conveyed of the extensive Plans and Drawings stated to have been prepared; and though we do not observe any allowance made in the estimated cost for remunerating the Zemindars and land owners for the ground to be occupied by the Canal, and as therefore on this account, and probably many more, extensive alterations to the estimate must be made, still so much of the important preliminary work has been done, and the vast utility of the Canal, as we hope, so fully established in our preceding Paras., that we beg most respectfully to recommend the further consideration of the project, and to be favoured with the orders of Government towards carrying it out. Should, however, the Government harbour misgivings respecting the successful execution of this project in any of its parts, it occurs to the Board that the subject is of sufficient importance to countenance a suggestion that the whole Scheme may be submitted to the scrutiny of men of the highest professional repute in this branch of Engineering in England.

14th. With reference to a further reduction of the present rates of Tolls, we beg to submit, that if the construction of the Canal, or any other work of equal importance and magnitude be determined upon, it will probably be advisable to continue the rates as at present, with the view of ensuring an annual surplus in furtherance of the great work now proposed. This surplus, as respects the Nuddea Rivers, would doubtless be somewhat diminished by the outlay for keeping up the establishment of lighters for Canals, as recommended in our Letter, No. 5817, of 12th instant, should that suggestion be acted upon.

15th. But if the great work, whatever it may be, be not taken in hand, we beg to suggest that the Tolls on the Nuddea Rivers be abolished altogether, unless Government propose acting extensively on the suggestion referred to in the last Para., in which latter case the Tolls might be hereafter reduced, when it shall have been ascertained by experience what the probable amount of lighterage will be; and regarding the Calcutta Canals, as nothing remains to be done to them beyond ordinary repairs and renewals of wear and tear, we would suggest, that the Tolls there also be reduced, so that the amount realized might merely cover all costs and charges of maintaining them.

We have, &c.

(Signed) J. CHEAPE, *Lt.-Col. Chief Engr. M. M. B.*
 „ R. BENSON, *Lt.-Col. Offg. M. M. B.*
 „ T. M. TAYLOR, *Lt.-Col. M. M. B.*

No. 49.

No 2935

FROM THE MILITARY BOARD,

TO THE HONORABLE W. W. BIRD, ESQ.

Deputy Governor of Bengal.

Revenue Department.

Fort William, 30th August, 1844.

HONORABLE SIR,

In continuation of our Letter, No. 6110, of the 26th January last, on the subject of the most advantageous mode of applying the whole, or a portion, of the Surplus Collections from the Nuddea Rivers and Calcutta Canals, we have the honor to submit the annexed copy of a Letter, No. 58, of the 18th May last, from the Accountant General, which enables us now to furnish a correct statement of the Net Surplus from the Collections, at present in the hands of Government.

2nd. The subjoined statement does not exhibit the cost of excavating Tolly's Nullah, and as the outlay was not borne by the Government, but by Colonel Tolly, its omission is of no consequence.

Submit copy of a Letter from the Accountant General, by which the Board are enabled to furnish a correct statement of the net surplus from the Collections of the Nuddea Rivers and Calcutta Canals, at present in the hands of Government.

Statement shewing the Expenditure and Toll Collection on the Circular Canal and Tolly's Nullah and Nuddea Rivers, for 1842-43 and 1843-44.

Years.	Expenses for improving Navigation, &c., including salary and establishment.	Expenses on account of Toll collection.	Total Expenditure.	Gross Collection.	Surplus.	Total Surplus.	
1842-43, ..	12,699 11 5	10,003 7 10	22,703 3 3	1,60,595 7 4	1,37,892 4 1		
1843-44, ..	31,841 8 1	10,368 7 6	42,209 15 7	1,66,491 5 8	1,24,281 6 1	2,62,173 10 2	{ Circular Canal & Tolly's Nullah.
1842-43, ..	27,691 12 2	27,570 1 2	55,261 13 4	2,46,991 15 7	1,91,730 2 3		
1843-44, ..	30,777 5 4	21,027 6 8	51,804 12 0	2,33,091 13 0	1,81,287 1 0	3,73,017 3 3	Nuddea River.
Total Surplus of the years 1842-43, and 1843-44.						6,35,190 13 5	
Surplus of Collection of the Circular Canal, Tolly's Nullah, and Nuddea River, up to the 30th April 1842, Reported to Government on the 26th January 1844, ..						32,35,950 9 7	
Total Surplus up to the 30th April 1844, ..						38,71,141 7 0	
Deduct the original cost of excavating the Balleaghatta Canal, which was not deducted from the Statement of Surplus already submitted to Government, as it was then not known, but this information is now obtained from the Accountant General, vide his Letter, No. 58, dated 18th May 1844, ..						1,53,720 2 11	
Net Surplus Rs.						37,17,421 4 1	

We have, &c.

(Signed) J. CHEAPE, *Lt.-Col. Chief Engr.*
 „ R. BENSON, *Lt.-Col. M. M. B.*
 „ W. BURLTON, *Lt.-Col. M. M. B.*

No. 49. a.

No. 58.

TO THE SECRETARY TO THE MILITARY BOARD.

SIR,

Referring to my Letter to your address, No. 312 A. of the 3rd November last, stating that the Officers named in the margin have been addressed for information relative to the Tolly's Nullah and the Balliahghatta Canal, and that on the receipt of their reply the statement called for in your communication of the 27th July preceding, No. 2080, would be furnished; I have now the honor to acquaint you, that the above authorities having failed to afford any information on the subject, I applied to the Secretary to the Government of Bengal for any documents in his Office that might throw light on the case, when I was favoured with the proceedings of Government from 1775 to 1805. On perusal of many of these papers, I learn that on the 4th September 1775, Colonel Tolly proposed to Government to cut a navigable Canal at his own expense from Salmon's Bridge to Balliahghatta, afterwards called Tolly's Nullah, in consideration of a Grant for 12 years of a Toll at 1 per cent. on the Invoice value of all goods brought by that navigation. This proposal was approved by Government as per Resolution, dated the 28th December 1775, and the Grant allowed for the period specified. On the death of Colonel Tolly, this Grant was continued for 15 years to his widow, who remained in possession till the expiry of the lease on the 4th July 1804,

Revenue Department.

Collector of 24 Pergunnahs.
 Deputy Collector of Calcutta.
 Secretary to the Sudder Board of Revenue.

when the Canal was taken possession of on the part of Government, and Tolls began to be collected for the first time by Government Officers. From the above statement, the Board will perceive, that the information required by them as to the original cost of excavating Tolly's Nullah cannot be ascertained, as no accounts of such expenditure were rendered by the Grantee to the Office of Accountant, nor, as the expense was not borne by Government, does the information seem to be of material consequence—the whole transaction was of a private character.

As regards the Balliaghatta Canal, I have the honor to state, that the cost of excavating this Canal appears, on reference to the books of this Office, to have amounted to Company's Rupees 153,720-2-11½, as shown in the Memorandum hereto annexed.

I have the honor to be,
Sir,
Your most obedient servant,
C. MORLEY,
Accountant General,

FORT WILLIAM,
ACCOUNTANT GENERAL'S OFFICE,
The 18th May, 1844.

No. 49. a.⁽¹⁾

Memorandum shewing the original Cost of Excavating the Balliaghatta Canal.—Extracts from the Books of this Office.

When charged.	Description of Charges.	Amount in Co.'s Rupees.	
1819-20.	Amount paid the Committee for Improving the Town of Calcutta, being the sum disbursed from their Funds for the original construction of the Canal at Balliaghatta, Sicca Rupees,	51,499 3 5	54,932 7 11
	Interest thereon from the period of expenditure up to the 28th October 1819, in consideration of the transfer of the Canal to Government,	23,708 6 5	25,288 15 4
1799-1800	Purchase of Lands for the New Canal,	25,403 7 0	80,221 7 3
1808-9.	Ditto of ditto for ditto, as per Board's Order of 9th August 1808,	21,480 0 0	27,097 0 0
1809-10.	Paid for construction of Roads in the vicinity of Canal from Boitakhannah to Salt Water Lake,	10,396 4 0	22,912 0 0
1810-11.	Purchase of Lands for the New Canal,	11,050 2 0	11,089 5 4
1811-12.	Ditto of ditto for ditto,	575 4 0	11,786 12 9½ 613 9 7
Company's Rupees,			1,53,720 2 11½

(Signed) C. MORLEY,
Accountant General.

FORT WILLIAM,
ACCOUNTANT GENERAL'S OFFICE,
REVENUE DEPARTMENT,
The 18th May, 1844.

No. 50.

No. 3041.

To F. P. STRONG, ESQ.

Surgeon of the Suburbs, &c. &c. &c.

SIR,

I am directed by the Committee upon the Fever Hospital and Municipal Improvements, to transmit to you herewith the Papers noted in the margin, with which you sometime ago furnished them, and which they are desirous of completing, and will be obliged if you can assist them in that particular.

1. Letter from J. Master, Esq. Magistrate Suburbs of Calcutta, dated 6th October 1828, to Messrs. Jessop and Wilson.

2. Minute on the unhealthiness of the Suburbs by Dr. Briton.

3. Letter from J. Master, Esq. dated 7th October 1828, to Mr. T. Wilson.

4. Letter from ditto, dated 12th October 1828, to ditto.

5. Letter from H. Shakespear, Esq. Secretary to Government, dated 27th November 1828, to J. Master, Esq.

6. Letter (printed) from Committee of Improvements in the Suburbs (no date) to Government.

7. Memorandum on the unhealthiness of the Intally Suburbs by Mr. T. Wilson.

2. In Mr. J. Master's (Magistrate of the Suburbs) Letter of the 7th October 1828, to Mr. T. Wilson, there is a reference made to a Petition by the Inhabitants of the Suburbs to the Governor General, relative to the state of the Drains in their neighbourhood, the Committee will be obliged if you can procure for them a copy of this Petition, together with a copy of Mr. Wilson's letter to Mr. Master, transmitting the Petition for his perusal.

Mr. Master's letter also refers to obtaining the *more copious* remarks of Dr. Briton on the state of the Suburbs,

will you kindly state if you are aware whether these more copious remarks of Dr. Briton were obtained—if so, can they now be procured from the office of the Magistrate of the 24-Pergunnahs.

3rd. Mr. H. Shakespear (Secretary to Government) in his letter of the 27th November, 1828, to Mr. Master, in reply to that gentleman's Report on the Suburbs, dated the 3rd of the same Instant, (in reply to a letter from the Secretary to Government of the 25th September 1828,) states that "His Lordship in Council regrets that

1. A Copy of this Report will also oblige.

2. A Copy of this letter is likewise thought necessary.

"the necessity of strict economy prevents his authorizing any considerable immediate outlay from the Public Treasury in furtherance of the very important objects of Improving the Salubrity of the Environs of the City. It only remains therefore to consider how far it may be practicable to supply the Allypore Jail with convicts from the Jails in Bengal, for the purpose of making such of the Improvements suggested, as can be carried into effect by the labour of convicts."

3rd. "It occurs to His Lordship in Council, that prisoners now under sentence of banishment to the number of twelve or thirteen hundred in the Jails within the Division of Moorshedabad, Dacca, and Calcutta, might be transferred to the Allypore Jail under the orders of the Nizamut Adawlut, and the Court will accordingly be consulted on the propriety and expediency of adopting the measure." Will you be so good as to state if you are aware if *more convicts were made available at the Allypore Jail to improve, cleanse, and keep in order, the Suburbs, in consequence of the reference of the Government to the Nizamut Adawlut.*

4th. In the letter (printed) of the Committee of Improvements in the Suburbs (no date) to Government, reference is made to the following papers.

First. Letter from Secretary to Government (no date) to the Committee of Improvements in the Suburbs, enclosing an extract of a Memorandum relative to the Improvements of Intally and Tilljullah.

Second. Representation made by the Intally Committee to the Government relative to the Intally Suburbs.

5th. The Committee will be obliged by your furnishing them with these papers, or such of them as may be in your power, and at the same time by your stating the *name* of the gentleman to whom the representation of the Intally Committee had been referred,

and who agreed in the necessity of some Improvements taking place. The Municipal Committee would also like to be furnished with a copy of the Memorandum containing the Improvements suggested by the gentleman noticed above.

6. Among the papers now transmitted for your persual is a paper from Mr. T. Wilson entitled "Memorandum on the unhealthiness of Intally and the Suburbs of Calcutta"—the Committee will be obliged by your stating, if you are aware whether the above Memorandum has been submitted to the Government or the Magistrate of the Suburbs, if so, they will thank you to furnish them if in your power, with a copy of the letter which transmitted the above Memorandum, and at the same time inform them what resulted from the transmission of that document.

MUNICIPAL OFFICE,
TOWN HALL :
5th March, 1846.

I have the honour to be,
Sir,
Your most obedient servant,
(Signed) J. MORRIS,
Clerk to the Committee.

No. 50. a.

TO MESSRS JESSOP AND WILSON.

Entally.

GENTLEMEN,

As you were kind enough on a former occasion to interest yourselves in the Improvement of that portion of the Suburbs in which you reside, I request you will do me the favor of pointing out, with reference to the accompanying Extract of a letter from Government, any particular works which you may consider calculated to promote the object in view, and to suggest where it would be advisable to excavate tanks or remove jungle; the manner in which the Suburbs of Calcutta may be more effectually drained, and in fact any particulars, which may have fallen under your own observation.

As the season for conducting such works is fast approaching, I shall feel much obliged by an early communication of your sentiments.

FOUZDARRY ADAWLUT,
SUBURBS OF CALCUTTA :
The 6th October, 1828.

I am,
Gentlemen,
Yours obediently,
(Signed) J. MASTER,
Magistrate.

No. 50 a.⁽¹⁾

Extract of a letter from the Secretary to Government in the Judicial Department, under date the 25th September, 1828.

"I am directed by the Right Honorable the Governor General in Council to desire that you will submit to Government your sentiments on the practicability of remedying, generally, the unhealthiness of the Environs of Calcutta."

(Signed) J. M.
(A True extract,) Magistrate.

No. 50. *b*.*Note by Doctor Briton on the Insalubrity of the Entally Suburbs.*

The unhealthiness of Entally is lamentably verified by the number of deaths which have occurred to the inhabitants within the last few years. The insalubrity is doubtless owing to the want of public Drains; to the filthy state of those in existence, which at present are wholly useless for the purposes intended; to the want of public Tanks for the supply of good water to the Residents; and, above all, to the want of free circulation of air from a variety of causes.

To remedy the evils under which the inhabitants of Entally are unquestionably suffering, I know of no better plan than the one which a body of the Residents are at present adopting, from the best possible of motives, that of preserving human lives and conducing to the health, welfare and comfort of the community at large, Native as well as European, in the Suburbs of Calcutta.

P. BRITON.

*Superintendent of*No. 50. *c*.

To T. WILSON, ESQ.

SIR,

I feel much obliged to you for having forwarded the accompanying petition* for perusal, and I see no reason why it should not be submitted to the Governor General, notwithstanding the communication which I yesterday sent to you.

I am sorry that you did not occasionally acquaint me with the state of particular Drains and Roads (alluded to in the petition) as I hope you have no reason to suppose, that such references would not have met with immediate attention—their condition is only to be ascribed to the small number of convicts at the disposal of the Magistrate, and his very limited resources in other respects.

I am much indebted to you for the readiness with which you seem disposed to meet my wishes, and it will give me satisfaction to meet yourself and other Gentlemen, residents of Entally, in furtherance of objects so desirable, and which the Government seem prepared to patronise.

Your's faithfully,

J. MASTER.

ALLIPORE,

7th October [1828?]

I will take an opportunity of addressing Dr. Briton—his local and professional knowledge will render his suggestions highly valuable—and he will no doubt have the kindness to favor me with his sentiments at length—instead of the concise manner in which he has furnished the certificate.

J. M.

* The Municipal Committee have not before them a copy of this petition, nor copy of the Letter referred to in the Paper marked No. 50. *d*., nor an Official copy of the Letter, noticed on the margin as No. 6, of the Letter marked No. 50.—J. M.

No. 50. *d.*

To THOMAS WILSON, ESQ.

SIR,

* See Note at
foot of Papermark-
ed No. 50. c.

I have been favored with your letter* of this date, for which I beg to offer my acknowledgments.

It occurs to me that the space to which you propose to confine your observations may be considered too limited, and your suggestions would prove doubly valuable and interesting, if you could make it convenient to extend your remarks to Seealdah and Curyah—and this you will perhaps be able to do, with Mr. Beeby's kind aid, particularly as a trifling delay will be immaterial. It will give me very great pleasure to meet yourself and Mr. Beeby, as soon as our respective thoughts on this important subject are a little more matured.

Your's faithfully,

J. MASTER.

12th October, 1828.

 No. 50. *e* — See No. 51. *f*.

No. 50. *f*. omitted to be printed—
See Note at foot of Paper marked No. 50. *c*.

No. 50. *g*.

*Memorandum of matters or causes which, it is believed, occasion the
Insalubrity of Entally and the adjacent parts in the Suburbs of
Calcutta. By T. WILSON, ESQ.*

While the causes may be said to be various, the following may be said to be some of the chief, if not the only ones.

1st. From the want of a more free circulation of air occasioned by jungle, which in some parts is so very thick as to appear quite impenetrable.

2nd. To the great quantity of leaves, which falling into the drains, decay and putrefy—the falling of the leaves into the drains is occasioned by their being, in numberless places, overhung with trees, which not only branch over the drains, but the roads also, the evils arising from this might be obviated by having all such trees, whose branches overshadow the roads and drains, cut down as nuisances, which no where should be allowed to exist.

3rd. To the water in the drains becoming stagnant for want of having a free course (the stoppage of the water in the drains may be occasioned partly by the leaves of trees and other substances getting into the drains and blocking up the passages of them)—of the unwholesomeness of stagnant water, it need hardly be mentioned, it being universally acknowledged, that disease is occasioned by it, and that pestilential matter may be taken into the stomach in the act of breathing, and thereby occasion fever and other most direful effects and disorders.

4th. To the noxious exhalations arising from decayed leaves and other hurtful substances, as well as from small ponds or tanks and other marshy and swampy places, which abound in the Suburbs. The most of these are occasioned by *brick merchants*.

5th. To the exhalations arising from the [Entallee] Canal, which in consequence of its containing so large a body of *stagnant* water and other impurities, proves a fountain, or source of pestilence.

6th. To the effluvia arising from human ordure. In the Suburbs the *maturs* never convey the filth to the river—nor do such of the Natives who have necessities, ever keep them clean; but as their necessities have a communication with the public drains, the filth runs into them. But the major part have no necessities. In many instances they dig holes in the earth, where they bury the filth, but as these holes in the earth, where they bury the filth, are seldom of sufficient depth, the effluvia at times is not only offensive, but, as must naturally be the case, very hurtful from the increasing quantity and concentration of effluvia by the excrementitious matter in the drains, &c., suffered to assume, unre-moved, a putrescent action, extremely prejudicial to the health of the inhabitants.

7th. To the noxious exhalations arising from the putrefying bodies of calves, dogs, cats, snakes and other dead animals, which often lie in a state of complete putrefaction in the jungly parts of the Suburbs, and are constantly in the night thrown there, under the trees, by the Natives themselves.

8th. To the want of proper drains for draining off of stagnant waters from the drains, and this of itself would go a great way in contributing much towards rendering the climate more salubrious, for the drier land becomes, the more will fatal diseases decrease.

9th. To woods or jungles, which in many places are so very thick as to appear, as before mentioned, to be impenetrable, the consequences of which is, that, the beams of the sun being thereby hindered from penetrating to and warming the soil, the soil becomes damp, the air confined, and the vapour arising from the ground so *corrupt*, as to effect the whole of the surrounding atmosphere, and when storms and gales arise, putrid particles of all kinds are flown about, far and wide, in every direction.

10th. To increased population, and the hoarding together of the Natives in large bodies.

11th. To the want of a sufficient number of Tanks containing a sufficiency of good and wholesome water.

12th. To the want of good broad roads, the present ones being extremely narrow, winding, and wretchedly laid out.

13th. To the Lake to the east, the noxious exhalations from which have long been noted as occasioning sickness—by deepening its channel—bundling and draining it, many thousand Begahs of *valuable* land would be restored to agricultural purposes, and afford the means of supplying the wants of a large and still increasing population of this country, besides from the sale and revenue of it, much might be obtained towards defraying the expences of making the Suburbs more salubrious.

That exhalations and other noxious vapours arising from jungles &c., do really occasion sickness of various kinds, the page of History, and the experience of mankind, fully testify, not only in India, but in every other country in all parts of the habitable globe, these evils are great, and many loudly call for protection.

One of the chief causes of these distresses might easily be removed by opening a number of main and cross roads running from East to West and North to South, by which means, besides the cutting down of the trees which hang over the public Roads and drains—the trees thus cut down, a very considerable part of jungle would be not only removed and a more free circulation of air obtained, but it would have the further advantage of being the means of causing a great number of Europeans and East Indians who are now becoming very numerous, to settle in the Suburbs; and Entally and Teeljullah being so near the centre of the Town, they would prefer those to all other places in the Suburbs, by which means the Suburbs would become better cultivated and jungle altogether removed—for the Natives would then go further into the interior, and with them,

their filthiness—for the natives are certainly the most filthy sort of people on the face of the earth, and want of cleanliness is acknowledged to be a great cause of want of health, &c.—A further advantage to be gained hereby, would be, that, a great number of houses would then be built—the proprietors of which would be most glad to pay, as in Calcutta, a tax for the repairs &c. of the streets.—But perhaps enough has been said, and leaving the matter to wiser heads, they will devise means for increasing the salubrity of the Suburbs, which, beyond a doubt, will have the effect of making Calcutta itself more healthy.

(Signed) THOS. WILSON.

No. 51.

To JAMES MORRIS, ESQ.,

Clerk to the Committee upon Municipal Improvements—Calcutta.

SIR,

In reply to your communication dated the 5th March 1846, transmitting to me certain papers with which I had furnished the Committee, and requesting my assistance towards completing them, I beg to state, that to enable me to comply with the Committee's request, I placed myself in communication with the Register to the Court of Nizamut Adawlut, and the Judge and Magistrate of the 24-Pergunnahs. The papers and information that I have been able to obtain from the Officers above cited, though not quite all that you have applied for, I have the honor to transmit herewith, together with the papers received from you.

I am, Sir,

Your obedient Servant,

F. P. STRONG.

8th March, 1846.

Surgeon to the Mysore Prince's, and to the 24-Pergunnahs.

No. 51. a.

Extract—Letter from W. H. MACNAGHTEN, ESQ., Register Nizamut Adawlut, dated 15th August 1828, to H. SHAKESPEAR, ESQ., Secretary to Government, transmitting Copy of the Letter of the 3rd Judge, and its inclosures.

“ 2. The Court direct me to observe that, on the present occasion, they have no particular remarks to offer ; but they agree with the Circuit Judge in opinion that the remarks of Mr. Surgeon Strong, relative to the unhealthiness of the Environs of Calcutta, are well worthy of the consideration of Government.”

No. 51. b.

Extract of a letter from H. SHAKESPEAR, ESQ., Secretary to Government, dated 25th September, 1828, to W. H. MACNAGHTEN, ESQ., Register Nizamut Adawlut, in reply to his letter of the 15th August, 1828.

“ 3. The Magistrate of the Suburbs will be desired to submit his sentiments to Government on the practicability of abating the nuisance complained of by Dr. Strong, and of remedying generally, the unhealthiness of the Environs of Calcutta.

No. 51. c.

J. MASTER, ESQ.,
Magistrate of the Suburbs of Calcutta.

SIR,

I annex an extract from Mr. Surgeon Strong's remarks respecting the Insane Hospital, and request that you will, in concert with the Magistrate of the 24-Pergunnahs, endeavour to remove the nuisances therein complained of.

2nd. A copy of this letter will be transmitted to the Magistrate of 24-Pergunnahs, for his information and guidance.

I am, &c.

BELVEDERE,
The 11th August, 1828.

(Signed) ROBERT BROWN,
3rd Judge.

No. 51. c.⁽¹⁾

Extract—MR. SURGEON STRONG'S Remarks respecting the Insane Hospital.

["It will be seen that the number of deaths in the Insane Hospital, in these six months, has been only 10, a number considerably less than has been usual during the same period for the last twelve years.

"It appears to me that this advantage has been produced by the making of four sunken and covered necessities, the nuisance having previously been conveyed by an open drain from the Hospital and round the grounds.

"I have the pleasure also to report, that there has since been much less illness than usual, which I consider mainly attributable to the improvement and change above alluded to." "I beg leave however to remark, that the grounds contiguous to, and outside of the Hospital premises, are, in my opinion, a most unwholesome nuisance, particularly during the rainy season—the water not being drained off, but lying in the various hollows, there stagnates, and, corrupting all vegetable and animal matter it meets with, produces an atmosphere most unwholesome, even to natives who are used to it.

"There is also close to the entrance gate, a burying ground, which brings together dogs, vultures, &c., which of themselves are a considerable nuisance; and upon which ground the prisoners from the Jail of the 24-Pergunnahs are daily taken in a body for their necessary occasions; were they to be taken nearer to the Nullah, to which this ground adjoins, or elsewhere, for such purposes, and the practice of burying discontinued at that place, it would be not only desirable, but would conduce to the healthiness of the Hospital." ["While remarking on the state of the grounds near the Hospital, it may not be irrelevant for me to observe, that having, for upwards of 20 years, applied my attention particularly to atmospheric causes of disease; and having now, for several years, been Surgeon of the Suburbs of Calcutta, I may not be going far, if at all, out of my line of duty, in pointing out, that I consider much of the unhealthiness of the Suburbs, as well as of Calcutta, during and after the rains, to arise, in a great measure, from the state of the lands in the Suburbs immediately round about the Town; but more particularly in the Soorah, Intally, and Ballegunge part of the Suburbs; the lands bordering upon these parts, especially to the eastward, are not only more covered with jungle and decaying vegetable matter than elsewhere, but in almost every part of them numerous irregular excavations are to be met with,

made for brick-making, and for similar purposes. In these various holes and cavities, impure air is generated by the decay and putrefaction of vegetable matter in water, and if impure air, so produced, is, as it is known to be, capable of causing fever and dysentery, it is not unfair, to conclude that certain modifications of this Malaria, may also be the cause of cholera, which disease predominates in those climates and soils in which fever and dysentery abound; that it may be so produced is, I think, sufficiently obvious, by the well ascertained fact, that ships' crews, in a state of perfect health, and a considerable distance, even some miles from the shore, have, by a sudden land wind coming on, been fatally attacked by this scourge. A striking instance of this nature is recorded by Dr. MacCulloch, in his very valuable work, lately published on the subject of Malaria—a work entitled to the particular attention of medical men and others, in this country, which is so pregnant with this source of disease. I will here add, that I can name, at this moment, several families about Intally, where the whole family are laid up with fever, produced, most indisputably, by the impure air generated about their neighbourhood by the decomposition or decaying of vegetable substances; and several are now removing up to Chinsurah, and to other places, their removal being more conducive to their recovery than any medicine they can take, while they continue to breathe this atmospheric poison.”]

NOTE.—The Paragraphs within Brackets, though part of Mr. Strong's Remarks, do not form part of the Extract annexed by Mr. Brown to his letter to the Magistrate of the Suburbs.—J. M.

No. 51. d.

To JOHN MASTER, ESQ.,

Magistrate of the Suburbs of Calcutta.

SIR,

I am directed by the Right Honorable the Governor General in Council to desire, with reference to Dr. Strong's remarks, a copy of which was transmitted to you by the 3rd Judge of the Court of Circuit for the Division of Calcutta, on the conclusion of the monthly sessions for the 1st six months of the present year, that you will submit to Government your sentiments on the practicability of abating the nuisances complained of by Dr. Strong, and of remedying, generally, the unhealthiness of the Environs of Calcutta.

I am, &c.

COUNCIL CHAMBER:
The 25th September, 1828.

(Signed) H. SHAKESPEAR,
Secy. to Government.

No. 51. e.

To H. SHAKESPEAR, ESQ.,

Secretary to Government in the Judicial Department—Fort William.

SIR,

I have the honor to acknowledge the receipt of your letter of the 25th of September 1828, in which I am directed to submit my sentiments as to the measures which should be adopted for remedying, generally, the unhealthiness of the Suburbs of Calcutta.

Deeply interested as I feel in the subject, and anxious as I must naturally be to secure the health and promote the comforts of the inhabitants of this district, I cannot refrain from respectfully expressing my regret, that an enquiry of such extent and importance, had not been entrusted to the medical authorities, by whom it would have been ably discussed and adequately treated—indeed so conscious have I felt of my inability to undertake the

task, that I have ventured to solicit from several Surgeons holding situations in the district such hints as might aid me in the investigation of a subject of so much obscurity, and which might render my reply to your communication more explicit and satisfactory.

I will do myself the pleasure of alluding to the suggestions, which those gentlemen have considerately favored me with, after noticing such points, as have fallen under my own imperfect knowledge and observation—

The following are, in my opinion, the chief causes to which the unhealthiness, which prevails in the Suburbs, may be ascribed.

1st. To insufficient draining, the insalubrity arising from which is confirmed by general impression and general experience.

2nd. To the extraordinary height to which the floods in the river Rise, spreading through the various water-courses over the low lands, but more particularly through the Acra Nullah, Tolly's Nullah, and the Chitpore Nullah.

3rd. To the lowness of the site of the Town and the innumerable pools of stagnant water, surrounded by trees of exuberant foliage, which exclude both air and sun, and thus convert the shallow Tanks into poisonous repositories of vegetation.

4th. To a lamentable deficiency of that indispensable element—water,—most of the Tanks containing only such as is contaminated by putrified vegetation, and from its deleterious quality totally unfit for domestic uses.

5th. To the want of a free circulation of air, which is obstructed by a variety of causes, but principally by the luxuriant growth of dense and almost impenetrable underwood in the compounds and uncultivated gardens of the Native population.

6th. To the accumulation of filth in the vicinity of the houses in the crowded part of the Suburbs, which vitiates the atmosphere, and to there being no establishment allowed for its removal.

7th. In the Eastern Suburb, to the noxious vapours which arise from the Entally Canal, and which, mingling with the air, pour forth a source of pestilence. The Canal containing a body of stagnant water, and being otherwise filled with impurities.

Lastly, to the circumstance of Calcutta being bounded on the whole of its Eastern side by an extensive morass, highly favorable to the production of a noxious and baneful atmosphere.

Such being in my opinion the main causes of sickness and disease, I will proceed to point out what occurs to me as remedial measures.

And first—with regard to insufficient, or perhaps, I should rather say, inefficient draining; for the evil consists more in the multiplicity of small ill-formed drains (which it is impossible to preserve in a free and unobstructed condition) than in any actual want of artificial channels.

The Southern Environ, situated between the River and the Road leading from Allipore to Tollygunge, which includes the whole of Garden Reach, is drained into the River through the sluice on the grounds now occupied by Sir Charles Metcalfe*—the tract of land situated between the above named Road and the Ballygunge Road, as well as a large portion of Chowringhee and Short's Bazar, is drained into Tolly's Nullah through Brijetullah; the level running from the West end of Dhurumtollah down to Bhowanypore. The Eastern Environ of the Town is drained into the Salt Water Lake, as well as a large portion of the land to the South of Ballygunge.

These facts being well ascertained, the Magistrate of the Suburbs would find little difficulty in promoting a more effectual drainage, were he supplied with an ample number of convicts, or put in possession of funds, which would enable him to command the constant services of hired labourers.

* ? Now tenanted by Sir Lawrence Peel; August 1846.—J. M.

To check the influx of the River water at high tides, it would be advisable to have bunds of a broad and solid nature, constructed from the end of Garden Reach to the old Powder Mills: and cross roads or bunds should branch also towards Russapuglah from the Hooghly River to Tolly's Nullah; but this subject requires knowledge which I do not possess, and which perhaps an Engineer alone would be competent to furnish—on one point I believe there is little difference of opinion, that the outlets from each main drain should be supplied with self-operating sluice gates, built of substantial masonry, which would allow any unusual accumulation of water to escape during the rainy season, and at the same time present an effectual barrier against the highest tide.

Calcutta, with its Environs, was at one period similar to many parts of London, the whole was under water during the rains, and nothing but a low paddy field. It was raised in the first instance by each individual digging a small Tank, from which earth was obtained for the purpose of raising the foundations of houses above the water's level, these swamps were subsequently filled by the filth thrown into them in succeeding years. Tanks of larger dimensions were excavated by Natives, who accumulated wealth under the protection of the British Government. Gardens were planned—Land gradually assumed higher rate or value, and Calcutta is now raised many feet above its original level. I have also understood, that the present Circular Road, which was nothing more than a broad deep ditch, when Lord Wellesley reached the country, was principally filled up by the filth collected in the Town.

One of the principal inducements to increase the existing number of stagnant pools in the Suburbs, is the extraordinary profit arising from the manufacture of bricks, and some salutary rule* might perhaps be enacted, prohibiting the preparation of kilns, within a certain distance of the Town.

The want of pure wholesome water is a privation seriously felt by the lower classes during the hot months of March, April and May, and the excavation of a few public Tanks on eligible spots, would materially contribute to the health, comfort, and cleanliness of the inhabitants. The spots, which appeared to me likely to meet the wants of a rapidly increasing population, I have taken the liberty of marking on the accompanying plan,† their construction would furnish earth, which the Natives would gladly remove at their own expense, to fill up many of the surrounding swamps, and improvement would go forward with the exertions of Government.

The healthiness of the Suburbs, would doubtless be greatly advanced by an annual clearing away of all branches of trees within 8 or 10 feet of the ground, and of all brush-wood and jungle at the close of the rainy season; the circulation of air would also be promoted by the removal of all trees which overhang the public Roads, nor should any branch be permitted to project over the drains and ditches.

It would be a hopeless task, I fear, to endeavour to impress on the minds of the public, that such are the causes of disease, or to induce them by co-operation and on principle, to strive to eradicate them; still, much has been done of late years in the Suburbs, and the ventilation considerably improved by opening a variety of new Roads at a trifling expence to Government, and others are in progress which promise more extended benefits. Some of these recent improvements, I have marked in a bright yellow colour on the accompanying map, and the proposed new Roads in Intally division which are anxiously

* A Regulation forbidding the manufacture of Bricks within a certain distance of the Town, it is believed, was at one period in force, but has been repealed or become a dead letter.—J. M.

† This plan is stated to be not forthcoming, but a rough copy of it is in the Office of the Municipal Committee.—J. M.

desired by the inhabitants, and which I consider particularly essential, are made apparent by double dotted lines.

A. The first, which I should wish to see carried into effect, would be a straight broad Road, say 50 or 60 feet width, carried from the opening nearly opposite to Park Street, through the Curryah Bazar, towards the Lake.

B. The second, a Road of a similar description and similar dimensions opposite South Colinga Street, where it opens into the Circular Road.

C. Third, a corresponding Road commencing at Mr. Dowling's House on the borders of the Circular Road, and also to be carried towards the Lake.

D. D. D. The fourth, which I suggest, would be a Road of a semi-circular form, extending from the Cooleeah Bridge to Ballygunge, with which all the above described Streets should unite, and I fix upon this form, in order, that much valuable land and highly cultivated gardens may be avoided, and the line of Road be carried through a tract of country, where proprietors would urge few objections, and those by conciliatory measures, would in all probability be easily overcome. I could point out many others which would be eminently useful, but I confine myself to the above, as the most peculiarly beneficial alterations.

For the next cause of unhealthiness arising from the accumulation of filth in the houses of Natives, I know not what remedy to propose here, there is no demand for manure for agricultural purposes, and the only measure, which occurs to me as likely to be attended with advantage, is to give encouragement to the system of sinking wells, in which the filth would speedily undergo the process of decay.

In warm climates tranquil or stagnant water must be unsafe in any form, and the ill effects produced by the poisonous nature of the stagnated fluids in the Entally Canal, are acknowledged and complained of by all who reside within its influence—its power however will be in a great measure diminished, and the evil averted, by the excavation* of the proposed Circular Canal, which will afford from its connection with the River, a continual renovation of water, the impetus of which will scour the bed of the Canal, and thus add to the salubrity of its borders.

I will now take the liberty of alluding to the opinions expressed by the medical gentlemen, with whom I have communicated on this important subject.

Dr. Martin observes—"on assuming medical charge of the Governor General's Body Guard in October 1821, and referring to the existing Records of the Corps, I found, that the proportion of sick, particularly during the latter period of the rainy season, usually so much exceeded the average of Corps in Cantonments, that I submitted to Government, a Statement of what I considered the main causes of unhealthiness in the Body Guard, declaring my opinion, that they chiefly arose from numerous small shallow Tanks, then existing throughout the men's lines; a generally ill drained condition of the Cantonments; and the presence of underwood. Government was pleased at once to direct the removal of the alleged sources of insalubrity, by having the Pits and small shallow Tanks filled up, and one or two deep ones dug in their stead, at some distance from the lines, the grounds of which were also drained and cleared of jungle. The result of these measures was so remarkable, that but for the sudden departure of the Corps for Rangoon, I should have brought it to the notice of the Medical Board. I am confident, that in stating the reduction of fever cases during the unhealthy season, to have been from 120 and 130 per mensem, to between 30 and 40, I am in no respect over-estimating the advantages of the improvements then partially carried into effect, and notwithstanding the hardships and exposure encountered during 18 months of foreign service, which naturally predispose to subsequent

* The Circular Canal has been excavated, but that part of the Entally Canal, from the head of the Dhurruntollah Road to the junction of the Entally Canal with the Circular Canal, being beyond the influence of the scour of the Circular Canal, is as bad as ever, and is still greatly complained of.—J. M.

illness, no one Native Officer or Trooper of the Body Guard, has died of fever since our return from Rangoon, in June 1826.

Dr. Stewart, the Assistant Surgeon stationed at Howrah, takes a more comprehensive view of the subject, and thus expresses himself—

“The inhabitants of these districts, both on the East and West sides of the River, suffer chiefly from Remittent and Intermittent Fevers, Dysenteries, Visceral and Glandular obstructions, regarding which diseases we may assume as an established fact, that they originate in all climates from that atmospherical poison, known by the name of Malaria.

“Of the nature of this poison, much has been said and written; but the most assiduous investigators of the subject, still confess their entire ignorance of its *constitution*. The laws, however, which govern its production and transmission, are sufficiently known, if not understood.

“Its *production* is traced chiefly to the operation of solar heat upon the soil, when more or less moistened with water. The soils most favorable to its elimination are the alluvial and argillaceous plains—particularly those marshy tracts along the banks or near the mouths of Rivers, which are covered by a mixture of Salt and Fresh Water, in situations where this is liable to stagnate until the return of the tides, and where it possesses during that period, the most abundant materials for the generation of miasmata from the incessant decomposition of animal and vegetable matter, subjected to high temperature, and at rest.

“The *propagation* of malaria (though occasionally very anomalous) seems to be mainly influenced by the prevailing winds; where these are irregular, or entirely wanting, it follows the course of running streams; and in ditches and over *tanks* it is held in concentration by embankments and belts of plantation. The most curious fact, however, in the history of *malaria*, and one wherein it contrasts strongly with *contagion*, which governs the epidemics of towns, is, that the former is less readily propagated through dense population, and dirty streets, than along the most spacious terraces, or through the thinly inhabited Suburbs; and that nothing checks the generation of this poison so much, as dense population and high cultivation. The most plausible explanation of this phenomenon is given by Dr. MacCulloch in the following words—‘*Malaria* is a chemical compound, and therefore decomposable. It is experimentally decomposed by fire and smoke, and it is therefore probable, that amidst the known mixture which forms the atmosphere of crowded streets, or habitations, it is actually destroyed.’

“In examining the Suburbs of Entally, and those on the East side of the Marhatta Ditch, and between that and the Salt Water Lake, the sources of Malaria are abundantly evident, and there can be no doubt, that in such a situation, the salubrity of the place may be greatly increased, were it possible to condense the present population or encourage its increase by opening of new Roads, founding proper Bazars, establishing public Tanks, (similar to that of Tank Square) and abolishing and prohibiting in future all private Tanks whatever—while the ditches might be likewise diminished in number, and rendered more effectual for the purposes of general cleanliness by an active Police.

“Such measures will not only prove remedial to the insalubrity of the Suburbs, but will greatly strengthen that barrier, which they now constitute, between Calcutta and the messtric exhalations of the Sunderbunds.

“I am unable from my own observations or inquiries, to ascertain how far the marshy tract, known by the name of *Salt Water Lake*, may possibly admit of being drained—and no doubt its muddy soil, and the strong tides and currents of Bengal, will of themselves prove great obstacles to any such undertaking; but from the introductory remarks I have made, it is quite evident, that a partial drainage will be quite insufficient for the purpose of annihilating the insalubrity complained of, nay it may even add to the evil; and that unless the portion or portions of land, so redeemed, can be speedily and effectually cleared

and reduced to cultivation, the Malaria will be greatly increased. The only effectual salvation from such a consequence, in my opinion, would be the building of high and strong embankments, such as shall narrow the marsh into Canals, and never be empty. Their inner fronts should be steeply sloping, so as to expose the smallest possible surface at ebb-tide above water mark—on both sides the grass should be kept closely cut, and burned or removed as soon as mowed, while colonnades of forest trees along the ridge on either sides will, in some measure, shelter the exposed mud from the exciting influence of the sun, without interrupting the free circulation of air.”

“With regard to the Sulkea Division of the Suburbs, which extends along the Western Bank of the Hooghly opposite to Calcutta, I have no doubt, that if some expense were employed by Government in improving its localities by filling up private tanks, digging proper ditches and public Tanks, in clearing away the low jungle, and improving the high way and bazars, this might be rendered not only perfectly salubrious, but greatly more so than Calcutta itself—a residence of two rainy seasons upon this side of the River, and the experience of old inhabitants, convince me, that those houses in particular, which are built on the steep Western bank, are peculiarly favored during the hottest season of the year, viz. from April to October, enjoying, as they then do, the South-east breeze, purified as we may suppose by its passage over Calcutta, from the marshy miasmata of the Sunderbunds, freed from dust, and cooled by its passage across the River. These houses in fact are, or may be considered, Sanatorium, and are used as such by many persons from Calcutta.”

In confirmation of the above, Dr. Strong, the Surgeon of the 24-Pergunnahs observes:

“In and about Calcutta, among the causes of unhealthiness, are the number of small dirty Tanks, and the large Drains from which the water does not run off—examples of these may be seen in every direction, but particularly along the Circular Road, the Boitakanah Road, and the Roads in and about Entalee and Sealdah. To those may be added the numerous holes or Tanks of shallow water which fill in the rains and stagnate in the dry weather. To remove these causes of Malaria it would appear necessary, that the drains should be kept in a clear state, so that the water should run off at once, and as to the holes or small Tanks they should be filled up.”

“It is not easy to point out what this nuisance, or Malaria, is, but the state of the soil has much to do with it: it is known to be formed in marshy or undrained spots, in wet woods, and in moist meadows, and the low and dense brushwood jungle, or thickets of reeds, or grass, so common in India, being the residence of moisture and decaying vegetation, is analogous to marsh lands and must produce much.”

I conceive that putting out of question the Sundurbunds and the Salt Water Lake, that the thickets of trees and jungle woods, pools, small stagnant tanks and jeels, which every where abound on each side of the Road, down from Chowringhee, Breejeetollah, to the end of Russapuglah, on each side of the Kalleeghaut Road on to Tolly's Bridge, on each side of Tolly's Nullah and the Road on the right of this Nullah, as far as the Insane Hospital, where the eye can hardly find any equality of surface, except on the Jeels and Tanks, and where the wild indigo and noxious weeds are growing in all directions; all this being situated South of the Presidency must be a constant source of disease, and disorders, many of which would vanish, if this pestilence could be removed; and, if I am not mistaken, I can trace illness from this very source (these weeds) to certain houses in Chowringhee, where occasionally in uninhabited houses, the compound, and round the Tanks, is to be found jungle weed, which must add to the Malaria, which is blown from the Russapuglah jungles over the Chowringhee part of the Presidency.

“I have heard it said, that this Lake, or marsh, was capable of being drained, and the lands redeemed and brought into cultivation; moreover, that it would probably be very valuable land for the cultivation of indigo, rice, and other products, the question of

draining, however, is one which belongs more to the province of a Surveyor to decide, and upon which I am unable to form any correct opinion."

In conclusion, I have the honor respectfully to solicit, that in the event of any of these undertakings being sanctioned, Government will be pleased to relieve me of a portion of the responsibility attached to them, by associating with me one or more members of the Lottery Committee, whose sphere of exertion at the present moment is unhappily very limited and contracted. I do not prefer this request from any desire to rid myself of a little additional labor, but Government is already aware, that besides the ordinary duties of my office, and the usual works attended to annually at this season in the Suburbs of Calcutta, I have this year to superintend the repairs of the Benares Road for a distance of 30 miles—half that extent of the Diamond Harbour Road, and the whole distance of the Road leading to Budge-Budge. I also trust, that in the perusal of the statements of the medical men on the subject of Drains and Ditches much blame will [not] be imputed to me by Government, as it is well known, that the means at my disposal are altogether inadequate to the maintenance of an efficient and satisfactory Drainage of the Suburbs.

FOUZDARRY ADAWLUT,
SUBURBS OF CALCUTTA,
The 31st October, 1828.

I have, &c.
(Signed) J. MASTER,
Magistrate.

P. S.—I have the honor to request, that the map of the Suburbs may be returned when no longer required.

No. 51. f.

No. 2582.

To J. MASTER, ESQ.

Magistrate of the Suburbs of Calcutta.

Judicial Department.

SIR,

[? 21/10/1828] The right Honorable the Governor General in Council has had under his consideration your Report, dated the 3d Instant, submitting your sentiments on the measures best calculated to remedy the unhealthiness of the Suburbs of Calcutta.

2. His Lordship in Council regrets, that the necessity of strict economy prevents his authorizing any considerable immediate outlay from the public Treasury, in furtherance of the very important object of improving the salubrity of the Environs of the City. It only remains therefore, to consider, how far it may be practicable to supply the Allypore Jail with convicts from the Jails in Bengal for the purpose of making such of the Improvements you have suggested as can be carried into effect by the labor of convicts.

3. It occurs to his Lordship in Council that prisoners now under sentence of banishment to the number of twelve or thirteen hundred in the Jails within the divisions of Moorshedabad, Dacca and Calcutta, might be transferred to the Allypore Jail under the orders of the Nizamut Adawlut, and the Court will accordingly be consulted on the propriety and expediency of adopting the measure.

4. The map which accompanied your report is herewith returned.

COUNCIL CHAMBER,
The 27th November, 1828.

I am, &c.
(Signed) H. SHAKESPEAR,
Secretary to Government.

No. 51. g.

No. 2588.

To W. H. MACNAGHTEN, ESQ.

Register of the Nizamut Adawlut.

SIR,

With reference to the 3d paragraph of my letter to you, under date the 25th of September last, I am directed by the Right Honorable the Governor General in Council to transmit to you, to be laid before the Nizamut Adawlut, the accompanying copy of a Report from the Magistrate of the Suburbs of Calcutta, dated the 3d Instant, together with copy of a Letter this day addressed to him by order of Government, and to request the sentiments of the Court on the suggestion contained in the concluding paragraph of that letter.

COUNCIL CHAMBER,
The 27th November, 1828.

I am, &c.

(Signed) H. SHAKESPEAR,
Secretary to Government.

No. 51. h.

To THE SECRETARY TO GOVERNMENT,

In the Judicial Department.

SIR,

Nizamut Adawlut.—Present.
W. Leycester, *Chief Judge.*
A. Ross, } Esqrs.
C. T. Sealy, }
R. H. Ratray, *Puisne Judge.*
M. H. Turnbull, Esq. *Officiating Judge.*

I am now desired by the Court of Nizamut Adawlut to acknowledge the receipt of your letter, under date the 27th of November 1828, and its enclosures, and to state, with reference to the 3d paragraph of your letter to the address of the Magistrate of the Suburbs of Calcutta, that the whole of the Magistrates and Joint Magistrates, in the divisions of Moorshedabad, Dacca and Calcutta, were called upon to state the number of prisoners which might be transferred from their Jail to the Jail of Allipore.

All the Returns* being now received, it appears that the entire number available for the purpose specified, does not much exceed 100 from all the Districts; and as the number required at the Presidency was 12 or 1300, his Lordship in Council will probably agree with the Court, that it would not be expedient to transfer to Allipore the comparatively small number of convicts available from the Districts originally destined for their places of banishment.

In explanation of the delay which has arisen in procuring information on the subject I am desired to observe, that it is chiefly ascribable to the confusion which in some measure ensued in consequence of the transfer of the Records from the Courts to the Commissioner of Circuit.

I have, &c.

FORT WILLIAM,
The 8th January, 1830.

(Signed) W. H. MACNAGHTEN,
Register.

* NOTE.—Owing, as stated by the several Magistrates from whom Returns were received, to the paucity of convicts, and to their being fully employed in the various Districts where they are located, in removing jungle and in constructing and keeping in repair Bungalows, Roads, Bridges, Tanks, Drains, and other Works of public utility.—J. M.

No. 51. i.

Extract from a Letter from F. O. WELLS, ESQUIRE, Magistrate of 24-Pergunnahs, dated 8th January 1835, to W. H. MACNAGHTEN, ESQUIRE, Secretary to Government of Bengal.

"3. I take this opportunity of submitting for the information and orders of the Governor General in Council, a copy of a letter received from certain inhabitants of Allipore and Kidderpore, soliciting the establishment of a Hospital in the Suburbs.

"4. During the last six months the number of sick and destitute has certainly been very great indeed. I am of opinion, however, that the cause of so large a number is temporary and extraordinary, and one that may not occur again for years. If, however, the Government should see fit to establish a Dispensary for the relief of the sick and supply of medicines to such persons, it would prove of the greatest use to the poorer inhabitants.

"5. The country to the Southward is occasionally very unhealthy, and the sick being unable to work, crawl up towards Calcutta in hopes of attracting the attention and obtaining the charity of their more fortunate countrymen; a Dispensary for the relief of such parties, where a small quantity of food was given in cases of sickness, would indeed prove a source of great benefit.

"6. I have no doubt that a portion of the expense might be defrayed by subscription if the Government would afford their support to the Institution, say 250 Rupees per mensem, to be disbursed and managed by a Committee appointed for that purpose.

"7. The situation ought to be near Kidderpore and Allipore."

No. 51. i.⁽¹⁾

TO F. O. WELLS, ESQ.

Judge and Magistrate of the 24-Pergunnahs.

SIR,

We the undersigned Residents of Allipore and Kidderpore, beg leave to represent to you, that we have observed on frequent occasions, with pain and regret, the dreadful mortality that prevails at times, more especially amongst the poorer classes of the Natives in this populous part of the country, who in most instances fall victims to their maladies from there not being any public Institutions to which they can resort for relief. Most of the people are too poor to obtain assistance from the Native doctors, who in general from their rapacity and ignorance, do more harm than good—consequently several deaths occur daily during the sickly seasons, which in a great measure might be prevented if you would kindly recommend and prevail on Government to establish with its usual humanity, a Hospital and Dispensary at Allipore, to afford Chirurgical and Medical relief to those persons who might require it. The expense, we presume, would be inconsiderable, and by no means commensurate to the blessings diffused, and as the present benevolent Government has established, at considerable expense, Institutions for the intellectual improvement of its

native subjects, we confidently hope it will not be averse to accede to the establishment of a Hospital and Dispensary at Allipore for the relief and preservation of the numerous poor at that place—Kidderpore and the neighbourhood.

We have, &c.

	(Signed)	A. ROGERS,
	„	J. KYD,
	„	G. DACOSTA,
	„	R. MORTIMER,
ALLIPORE AND KIDDERPORE :	„	SUTT SHURN GHOSAUL,
17th December, 1834.	„	J. TEIL,
	„	W. GREENAWAY,
	„	JNO. CAMPBELL.

No. 51. j.

No. 1266.

To J. H. PATTON, ESQ.,

Magistrate of the 24-Pergunnahs.

SIR,

I am directed by the Hon'ble the Governor of Bengal, to transmit to you copies of

* Letter from the Governors of the Native Hospital at Calcutta, dated the 1st instant, on the subject of establishing a Fever Hospital in this city.

Resolutions of the Governors of the Native Hospital of a special Meeting held on 20th ultimo.

Mr. Surgeon Martin's Topographical Notes on the state of Calcutta and its Suburbs.

Ditto additional Explanatory Note.

An Extract—Introductory Essay from Dr. Allison's History of Medicine.

the documents noted in the Margin,* and to request that you will submit† to Government, any observations on the subject treated on in those papers, which you may deem it proper to offer.

I have, &c.

(Signed) R. D. MANGLES,

Secy. to the Govt. of Bengal.

FORT WILLIAM :

The 16th June, 1835.

† For reply to the above Letter, See Appendix (B) page 4. to the Municipal Committee's Report.—J. M.

No. 51. j.⁽¹⁾

Extract referred to in the Paper marked No. 51. j.

In the Introductory Essay by Dr. Allison, on the History of Medicine prefixed to the *Cyclopædia of Practical Medicine* for December 1834, I find the following commencement to the second Chapter—

“Next to the additions which have been made since the end of the last century, to our knowledge of physiology we may place the numerous important observations by which our information as to the *external causes* of disease has been rendered more extensive and precise. These observations, and the inferences from them, demand the more attention from physicians, that they necessarily involve a kind of evidence essentially different from that on which we proceed in other medical enquiries. And if we do not hope that the progress of human wisdom and virtue would bear any proportion to that of human knowledge, we might expect that the lessons to be drawn from the enquiries would prove of even greater

consequence to the future happiness of mankind than any which we can gather from the history and treatment of diseases.

“ These enquiries have, in some instances, been prosecuted by individuals in civil life ; but the opportunities of making decisive observations on some of the causes of diseases, which occur in the experience of Medical Officers of fleets and armies, are much superior to those which other practitioners enjoy, and the peculiar nature of such observations has never been so well understood as during the last war.”

JUDICIAL DEPARTMENT :
The 16th June, 1835.

True Copies.

(Signed) R. D. MANGLES,
Secy. to the Govt. of Bengal.

True Copies.

J. H. PATTON,
Magistrate.

No. 52.

No. 348.

TO THE HON'BLE SIR J. P. GRANT, *Knight,*
Chairman of the Fever Hospital and Municipal Committee,
Calcutta.

HON'BLE SIR,

I have the honor to acknowledge the receipt of your Letter No. 1088, dated the 10th instant, and in compliance with the request contained therein, annex a Statement of Deaths that have occurred among the Native population of the Town of Calcutta during the months of January, February, March, and April last, prepared from the records of the Office of the Superintendent of Police, from which it will be seen, that the deaths among the Hindoos during the above period amount to 6,090, and Mahomedans, 2,824, making a total of 8,914, which averages at $2,228\frac{1}{2}$ per month.

2nd. I beg to apologize for the delay that has occurred in furnishing you this information, and regret it is not in my power to give a more complete statement exhibiting the mortality among all denominations of the inhabitants of the Town. The Return I now forward has been compiled from the Registers kept by the Police, at the two Hindoo Burning Ghâts, and the Mahomedan Burial grounds ; and its correctness may be generally depended upon as regards the total number of deaths, but the classification, except in cases of small-pox, may perhaps be questionable. I should also observe, that the bodies of the opulent and the more orthodox Hindoos, are sometimes taken for cremation to the “ Kalee Ghât,” but these instances are rare, and would hardly affect an average of deaths.

I have the honor to be,

Honourable Sir,

Your most obedient Servant,

J. H. PATTON,
Chief Magistrate.

CALCUTTA, POLICE OFFICE :
16th August, 1844.

No. 52. a.

*Statement of Deaths among the Hindoo and Mahomedan population
of the Town of Calcutta.*

Months.	Hindoos.				Mahomedans.			
	By Small-pox.	By Cholera.	By other complaints.	Total.	By Small-pox.	By Cholera.	By other complaints.	Total.
January 1844,	91	358	502	951	66	110	166	342
February,	240	692	383	1,315	215	406	170	791
March,	548	659	347	1,554	415	270	128	813
April,	493	1,440	337	2,270	263	491	124	878
Total,	1,372	3,149	1,569	6,090	959	1,277	588	2,824

J. H. PATTON,
Chief Magistrate.

No. 53.

Committee for improving the Town of Calcutta.

TO HIS EXCELLENCY THE MOST NOBLE RICHARD, MARQUIS
WELLESLEY, K. P.

Governor General in Council, &c. &c. &c.

MY LORD,

In the Letter* which we addressed to your Excellency in Council, under date the 4th instant, we had the honour to state that we had selected Special Committees to consider in the first instance the measures which should be adopted for improving the Town of Calcutta and its vicinity, and for raising the Funds required for those purposes.

* See App. (F.)
p. 305.

2nd. The Committee selected for the last mentioned purpose has since furnished us with a Report on the subject, in which they propose as follows—

First. “That the Assessment within the Town of Calcutta be raised on all houses the “rent on computed value of which shall exceed one Rupee per mensem, from 5 to 7½ per “Cent.”

Estimated Produce Rs. 50,000.

Second. “That the surplus Revenue of the Canal, commonly known by the name of “Tolly’s Nullah, be applied to the improvement of the Town and vicinity of Calcutta,”

Estimated Produce Rs. 30,000.

Third. “That the Fees of Office collected by the Magistrates of Calcutta be appropriated to the same purpose,”

Estimated Produce Rs. 10,000.

Fourth. “That the same application be made of the surplus Revenue arising from the “Markets within the Town of Calcutta and Fort William,”

Estimated Produce Rs. 5,000.

Fifth. “That the Surplus Receipts of the Court of Requests be appropriated to the “discharge of the expense of the projected Improvements.”

Estimated Produce Rs. 10,000.

Sixth. "That an annual Lottery be established for the same purpose, under proper management and control,"

Estimated Produce Rs. 60,000.

ABSTRACT.

" Increased Assessment,	..	..	...	..	Rs. 50,000
" Tolly's Nullah,	..	..	..	..	„ 30,000
" Fees, &c. &c.	..	..	..	..	„ 10,000
" Surplus of Bazars,	..	..	..	..	„ 5,000
" Do. of Court of Requests,	..	..	..	..	„ 10,000
" Annual Lottery,	...	...	..	..	„ 60,000

Sa. Rs. 1,65,000

3rd. Whilst we profess to concur generally in the sentiments of the Special Committee, we think it necessary to offer the following remarks to the consideration of your Excellency in Council, to enable you to form a more accurate judgment on the subject.

4th. The first resource suggested by that Committee is a qualified increase of the Tax on houses within the Town of Calcutta from 5 to 7½ per Cent.

5th. On a reference to the Act of Parliament passed in 33rd year of His Majesty's Reign, it does not appear to us that any objections exist to the proposed increase of Assessment, at the same time we are of opinion, that the Funds so raised must be exclusively "applied" (to borrow the terms of the Act) "to the cleansing, watching, and repairing of streets," and that the amount cannot properly be diverted to any other objects of Improvement. It does not, however, appear to us that this restriction will be felt as an inconvenience by Government or by the public, as considerable Funds will necessarily be required for purposes falling strictly within the intent and meaning of the Act of Parliament, particularly that of improving the present very defective plan of draining the Town.

6th. The next object which we shall notice from the Report furnished by the Special Committee, is the plan of raising Sixty Thousand Rupees per annum by means of a Lottery.

7th. We are aware of the objections which are usually urged against raising supplies in that way, but whatever force those objections may have in other countries, it does not appear to us that any ill consequences are likely to result from the establishment of a Lottery in India. The habits and confined means of the lower orders of the Natives, effectually excludes them from any participation in a Lottery conducted on a large scale. Even in England the evil does not arise so much from the purchase of tickets as from the Offices which are opened for ensuring them, which would of course be entirely prevented in this country.

8th. At all events, if Lotteries be necessarily injurious to the morals of the people, the evil is at present experienced in Bengal in as great a degree as it could be if the plan now proposed by us were to be adopted, as Lottery tickets are regularly sent round for sale from Madras.

9th. The remaining supplies suggested by the Special Committee do not constitute new resources, but either do now, or shortly will, form a part of the general Revenue of the State. It does not, however, appear to be less advisable on that ground to adopt the proposition of the Committee.

10th. Supposing Government to contribute to the expense of the projected improvements, it appears to us to be extremely desirable that certain Funds should be considered to be exclusively applicable to that purpose. On a reference to the different resources specified by the Committee, it will appear that they have either been recently established, or that they do not yet form a part of the actual Revenue of Government (as is the case with

Tolly's Nullah.) In either case we should presume that little inconvenience would arise from the proposed application of them to the projected improvement of the Town.

11th. Considering, however, the extensive nature of those improvements, it appears to us that it will be necessary for Government either to set apart further Funds for the purpose in question, or to advance a considerable sum during the next two or three years, to be gradually liquidated from the different supplies now proposed in the plan which we have the honour to submit.

12th. Impressed as we are with a full sense of the substantial benefits which the community will derive from the Improvements in contemplation, but at the same time sensible that those Improvements cannot be carried into effect without considerable expense, we anxiously wished to suggest adequate resources for that important object, but the restrictions existing by law on raising taxes within the Town of Calcutta have precluded us from submitting to your Excellency in Council so comprehensive a plan as we could have wished, for the purpose of providing effectually for the discharge of the expense of the Improvements, which (as we have already intimated) we consider to be essential to the convenience and health of the inhabitants of this populous City.

13th. In addition to the Report above alluded to, we have likewise received a Report from the Committee selected by us to consider the means best calculated for improving the Environs of the Town of Calcutta, containing the following remarks and suggestions:

First, "That the Road leading from the premises occupied by Mr. Logan along Garden Reach and Watson's Wall to Surman's Bridge be widened, that the Ditches be cleared, and that such Drains and Bridges be constructed as shall on a survey appear to be necessary for keeping the road free from water at all seasons of the year. From want of such Drains and Bridges a part of the Road is frequently inundated during the season of the rains. The stagnant water lying on the side of the Road is offensive to passengers, and must be injurious to the health of persons residing in that neighbourhood. In consequence likewise of the narrowness of the Road, and the abrupt turning near the premises belonging to Colly Sunker Goshaul, that part of the Road is not free from the danger to passengers—the house on those premises should at all events be taken down, for, so far as a judgment can be formed without an actual survey, it would appear to be in an insecure and dangerous state."

Second, "That a survey be made of the ground and villages lying between the old and new Roads leading to Garden Reach, and between the latter Road and Allypore, with the view of determining what improvements can be made in those suburbs."

Third, "That the exact limits of the Road leading from Surman's Bridge round Allypore to the Allypore Bridge be ascertained, and that all encroachments be removed, and that Posts or other marks be fixed to define the limits in future."

Fourth, "That the Cantonments of the Calcutta Native Militia be removed—those Cantonments are felt as a sensible nuisance by every person riding or walking round the Allypore Road; the Road itself is otherwise calculated as much or perhaps more than any other, to become the general resort of persons taking the air during the mornings and evenings. We have the less hesitation in recommending the adoption of this measure, as we conceive that the house and ground might be immediately appropriated to some public purpose, as for instance a Cutcherry for one of the public offices, which would completely indemnify Government for the expense of removing the above-mentioned corps to some more convenient situation. It has been suggested to us that material advantage would arise from removing the Cantonments to the vicinity of the Jail of the 24-Pergunnahs."

Fifth, "That the Ground lying on both sides of the Road near to the house occupied by Mr. Brooke, down to Allypore Bridge, be purchased on account of Government, and that the houses be removed. We have the less hesitation in recommending this measure, as we

“ understand that Government has long had it in contemplation to purchase the Ground in
 “ question, as appears from the papers annexed to this Report. In the last and former years
 “ considerable inconvenience was experienced during the season of the rains from the pools
 “ of stagnant water on the ground to which these remarks allude. By purchasing the Ground
 “ and putting it in order by the labour of the convicts, and with the excavations which must,
 “ at all events, be made from the Nullah; and afterwards by disposing of the property under
 “ restrictions, or applying it to some public purpose, it is presumable that the ultimate
 “ expense to Government will be very inconsiderable.”

Sixth, “ That the Ground lying to the Southward of the General Hospital be levelled,
 “ and the holes filled up with earth to be excavated from the Nullah. The bad state of
 “ the Ground lying between the Hospital and the Nullah has been more than once the
 “ subject of representations to Government, as being injurious to the Invalids and Conva-
 “ lescents in the Hospital. To remove that inconvenience effectually, further measures
 “ besides that immediately proposed, may be necessary. For the attainment of that object
 “ it was formerly proposed to make a cut from the Nullah not far from the Allypore Bridge
 “ through the Ground lying at the back of the Hospital. It has likewise been suggested
 “ to dig one or more large Tanks in that neighbourhood; but as the present is not the season
 “ of the year for carrying into effect works of that nature, and as the proposed cut appears
 “ to us to require mature consideration, we deem it sufficient to recommend that the
 “ Ground be levelled as far as may be practicable in the manner above suggested. With
 “ respect to the execution of that work, we conceive that the earth should be excavated
 “ during the time of the ebb, and carried away to the proper places by labourers and carts
 “ during the flood tides, when the men cannot be employed in excavating the earth. It
 “ appears to us that a considerable body of convicts might conveniently be employed in the
 “ execution of this work.”

Seventh, “ That a Road be made from near the Hospital to unite with the Russa-
 “ pugla Road, about a mile above the Bridge near Brijoo Talow, in a direction nearly West
 “ and East.”

Eighth, “ That the Road mentioned in the preceding Article be intersected by a Road
 “ from near the Hospital to Cally Ghaut, both of those Roads would be of material con-
 “ venience to the Natives.”

Ninth, “ That the Russapugla Road from Girryah Haut to Birjoo Talow be repaired,
 “ the exact limits of the Road ascertained, all encroachments removed, and (whenever
 “ necessary) additional Ground be purchased for widening the road. By the present
 “ almost impassable state of that Road the value of several considerable houses at Russa-
 “ pugla is greatly depreciated. The Road is likewise one of the principal avenues for the
 “ importation of Articles for the daily consumption of the Town.”

Tenth, “ That a Road be made from Russapugla through Baloogunge to unite with
 “ the great Circular or Boitacaunah Road near the European Burying Ground. By those
 “ measures, wood and other articles brought from Russapugla might enter the populous
 “ part of the Town without passing over the Esplanade or the principal parts of the Town
 “ occupied by European Gentlemen, as is the case at present.”

Eleventh, “ That the Bally Ghaut Road be widened. That Road is at present much
 “ too narrow for the number of people, hackeries and bullocks, which are constantly passing
 “ along it.”

“ It may tend to assist the judgment of the General Committee, and to facilitate the
 “ final decision of Government with respect to the improvements above suggested, to state
 “ the order in which, according to our judgment, those improvements should be carried into
 “ effect, and the preparatory steps necessary for the attainment of that object.”

“ As the expense required for the Improvements mentioned in the First, Third, and
 “ Fifth Articles of this Report will not be considerable, and as the season of the year

“renders any delay inconvenient, we are of opinion, that the projected improvements mentioned in those Articles should be immediately carried into effect. Early measures should consequently be taken for obtaining the Ground requisite for those purposes, and adjusting the compensations to the proprietors and tenants.”

“In like manner we are of opinion, that convicts should be employed as soon as possible to excavate the Nullah near the Hospital, with the view of giving effect to the Plan suggested in the sixth Article, and that a professional Gentleman should be desired to Report what further assistance may be required of coolies or hackaries for carrying the projected improvement into execution.”

“The removal of the Corps commanded by Major Downie (Article 4th) must necessarily depend upon the acquisition of another spot of Ground for the Cantonments of that Corps.”

“Immediate measures may be taken for marking out of the Roads (mentioned in the 7th, 8th, 9th and 11th Articles), and forming an Estimate of the expense required for making the Roads. Some delay must necessarily be experienced in the adjustment of the latter point.”

“The improvements of Bally Ghaut Road (Article 11th) might be suspended until the other objects shall have been partly carried into effect.”

“Exclusive of the abovementioned objects, other improvements will probably occur to us, which we shall hereafter have the honour to state to the General Committee. We have particularly adverted to Plans which have been suggested of making a cut from Tolly's Nullah around the great Circular or Boitacaunah Road, and of conveying it out to the Salt Water Lake: many advantages would certainly attend that Plan. At the same time we are apprehensive that it is liable to considerable objections. At all events we have thought it advisable to suspend our judgment upon that point until we shall have been furnished with the Report of the Special Committee for improving the Drainage of the Town, the two objects being naturally connected with each other.”

14th. The foregoing remarks being for most part sufficiently explanatory of the improvements proposed by the Special Committee, we only deem it necessary in a very few instances to trouble your Excellency with any additional observations on the subject.

15th. By the 10th Article of that Report it is proposed to construct a Road from Russapugla through Balloo Gunge, to unite with the Circular Road opposite to the European Burying Ground.

16th. When we consider the large daily supplies brought into the Town from that quarter, and the great advantages which would be gained by conveying those Articles of consumption into the populous parts of the Town by the nearest possible route, we cannot but be sensible that such a Road would be attended with much public convenience.

17th. At present, however, we would rather recommend that the Road proposed by the Committee in the 7th Article of their Report, should be carried on through Balloo Gunge to unite with the great Circular Road opposite to the Burying Ground.

18th. A Road in this direction would be productive of several advantages, and would answer many of the purposes of the Road proposed by the Special Committee in the 10th Article of their Report, and the expense would be less considerable, as the Ground required for the site of this Road is for the most part, the property of Government.

19th. The advantages which would be attained by the removal of the Cantonments of the Calcutta Native Militia, to the vicinity of the Jail of the 24-Pergunnahs, have attracted our particular attention, and in the course of our enquiries we have found strong reason for recommending this measure.

20th. Disturbances have occasionally occurred amongst the prisoners confined in this Jail, and upon a recent occasion when the number of persons confined exceeded nine

hundred, the Military Guard stationed for their protection and the security of the Jail was comparatively so inconsiderable, that the most serious consequences might have arisen had the prisoners acted with concert and unanimity.

21st. The recurrence of any similar danger will, we conceive, be best obviated by fixing the Head Quarters of the Calcutta Native Militia in the vicinity of the Jail.

22nd. An opportunity now offers to purchase a piece of Ground with a tolerable house at Russapugla, which we conceive to be peculiarly well adapted for the purpose of constructing the Cantonments in question, and we do ourselves the honour to submit a plan of this Estate for your Excellency's consideration.

23rd. The place is reported to us to consist of 60 Biggahs of Ground, and if a large space should be deemed requisite, a considerable addition may be made by purchasing and annexing to it the Ground lying between this Estate and Tolly's Nullah, which we conceive may be obtained upon reasonable terms.

24th. By those means the Cantonment would be bounded on one side by a running stream, which would contribute essentially to the health, comfort, and cleanliness of that corps.

25th. Should any objection however be urged against purchasing the ground now suggested by us on the score of insufficiency of space, we beg leave to state, that another house and a piece of ground consisting of one hundred and eighty Biggahs, and situated in the vicinity of the Jail, are advertised for sale, which we conceive would answer all the purposes that may be required.

CALCUTTA,
30th July, 1804.

We have the honor to be, &c.
(Signed) W. N. CAMERON,
C. BUCHANAN,
CR. GREEN,
J. TAYLOR,
R. H. COLEBROOKE,
JNO. SHOOLBRED,
D. BROWN,
G. DOWDESWELL
THOS. PRESTON,
THOS. GRAHAM,
MERRICK SHAW, E,
THOS. ANBUREY,
W. C. BLAQUIERE,
ED. THORNTON,
ALEXANDER RUSSELL,
WM. FAIRLIE,
RICHD. BLECHYNDEN,
J. J. B. PROBY,
T. COLEBROOKE,
J. ALEXANDER,
H. ST. G. TUCKER,
THOS. DASHWOOD,
S. DAVIS,
CHAS. F. MARTYN,
M. G. PRENDERGAST,
(True Copy.)

Compd. J. W.

CECIL BEADON,

Under-Secretary to the Government of Bengal.

No. 54

No. 3044.

TO THE CHAIRMAN AND MEMBERS OF THE COMMITTEE FOR
IMPROVING THE CONSERVANCY OF INTALLEE.

GENTLEMEN,

The Municipal Committee are desirous of knowing if there are any subjects recorded in the Intallee Committee's Proceedings in the shape of Reports or Minutes and Correspondence with the Government, which are likely to be of use in framing a report on the Suburbs. The Committee have directed me to request the favour of your answer on the above point. The Committee will also be obliged by your stating if the records of the Proceedings of the Intallee Committee, of which Messrs. Jessop, Wilson, and Beeby were the Members, have been preserved, and from where they may now be obtained: the Committee are desirous of referring to those records to complete certain information in their possession.

I have the honor to be,

Gentlemen,

MUNICIPAL OFFICE, TOWN HALL:

7th March, 1846.

Your most obedient Servant,

(Signed) J. MORRIS,

Clerk to the Committee.

No. 55.

To JAMES MORRIS, ESQ.

SIR,

Your Letter of the 7th March has been received and submitted to the Chairman and Members of the Intally Conservancy Committee, and in reply I am authorized to forward to you, for the information of the Municipal Committee, the accompanying copy of a Letter addressed by the Intally Conservancy Committee to the Civil Architect of Fort William, and by him submitted to Government in 1841, but to which no reply, beyond a general acknowledgment, has been received.

With respect to the records of the Proceedings of the old Committee, of which Messrs. Jessop, Wilson, and Beeby were Members, the Committee desire me to say, that they never came into the hands of this Committee, although many attempts were made to get possession of them. They cannot be found, and are supposed to be buried amongst the old records of the Magistrate's Office, 24-Pergunnahs, under whose care the Roads then were.

I have the honor to be,

Sir,

Your most obedient Servant,

W. B. SMITH,

INTALLY CONSERVANCY OFFICE:

21st April, 1846.

Honorary Secretary, Intally Conservancy Committee.

No. 55. a.

To CAPTAIN W. R. FITZGERALD,

*Civil Architect, &c. &c. &c.**Intally, 9th February, 1841.*

Sir,

1. Intally Conservancy Committee's Chairman's Letter to Captain FitzGerald, dated 19th February 1840.
2. Captain FitzGerald's Letter to Mr. Secretary Halliday, No. 383, dated 27th February 1840.
3. Mr. Deputy Secretary Young's reply, No. 760, dated 20th April 1840.
4. Capt. FitzGerald's Letter to Chairman of Intally Conservancy Committee, No. 17, dated 5th May 1840.

In advertence to the letters noted in the margin, all of which have reference to the transactions of the Intally Conservancy Committee for the year 1839, I have now the honour to address you on the same subject for the past year 1840.

The Committee have continued to labor unceasingly during the past year in endeavouring to improve the Roads and Drains of the Division committed to their charge, in which endeavour they have not been so successful as they had hoped, for the following reasons :

The number of convicts, which in my letter as per margin, dated 19th February 1840, was fifty-four (54) at that date, has since been reduced so low as forty-two (42), and although fifteen (15) have been lately added, the number remaining, viz. seventy-six (76) nominally, but really only sixty-one (61), after deducting the number required for jail duty, sick, &c. is quite inadequate to the performance of the duties of the extensive district under the charge of the Committee. Not less than one hundred and twenty (120) effective convicts are absolutely necessary to keep the Drains and Roads clear throughout the year, and even this number is insufficient during the rains. Should it happen that convicts are not available in whole or in part for these duties, the Committee beg to suggest that Dongah Coolies be employed in their room. The Committee venture respectfully but urgently to press upon the attention of Government the necessity of sanctioning this measure as they will otherwise be unable to perform the duties they have undertaken with satisfaction to themselves or advantage to the district committed to their care. This subject was brought to notice in our letters to your address, dated 17th [? 19th] February 1840.

Another matter noticed in my Letter of 1840, has been found during the past year to press heavy on the Committee. I allude to Overseer Sergeant Dyson, whose services are frequently required by the Magistrate of the 24-Pergunnahs in distant parts of the division, on other and distinct duty as a Constable or Petty Officer of [the] Allipore Court, to hold investigations &c.—During [the] Sergeant's absence his duties as Overseer of the Roads are neglected, and the instructions of the Committee unattended to ; without any [blame] attaching to the Sergeant. The Committee beg respectfully to urge that the extensive district under their charge requires the undivided attention of an active Overseer, as well as the vigilant inspection of the Members of the Committee, who are unable to do more than inspect and direct his labours, and those of the convicts under his superintendence.

The Ghowkhannah premises having been completed, the carts and bullocks have been housed therein since the 17th instant, and the rent (8 Rs. per mensem) paid for the former sheds has ceased accordingly.

The Committee notice with regret, that although the Conservancy bullocks are generally in good condition two or three occasionally fall ill, and the same number of carts are accordingly thrown out of work. The Committee would solicit an increase in the number of bullocks on this account, but if the request contained in the following paragraph be complied with, this will be unnecessary.

Rubbish, excellently well suited for repairing and preserving the Roads may frequently be obtained without payment by sending carts to take it away from the compounds of

houses under repairs, &c., but this is always required to be done *immediately*, and if not done by the Committee, private individuals are glad to avail themselves of the offer: much good material is thus lost to the Roads, for it rarely happens that the Conservancy carts can be spared to bring away more than one load a day.

The Committee beg to suggest, that it would greatly improve the Roads and diminish the amount of their annual estimates for *khoah* if five box-carts, with two bullocks each, were allowed for this purpose, and also to provide for sickness, as stated in the preceding paragraph. These carts and bullocks when not required to convey rubbish might be advantageously used in the district in aid of the present establishment which is not at all times equal to the demand made upon them. They might also be used for the Roller instead of hired bullocks, and thus save considerably in that item of annual expenditure. I herewith enclose an estimate of the expense of making the additional carts and buying and feeding the bullocks.

The Drains of the district continue to occupy the anxious attention of the Committee: each of my annual letters to your address have prominently noticed this serious subject. There is no system of Drainage, the levels of the Drains bear little or no reference to each other; and from want of means, the Committee are unable to do more than keep them open, and by raising some and depressing others, to induce the water and other liquids that come into them, to flow from one Road side to another, through gardens or fields or across Roads or pathways, such being their present course as stated in my letters to your address of 1839 and 1840. The Committee do not expect Government to incur the great expense of surveying the present course of the Drainage and recasting the whole, but if a sum of two thousand Rupees (2,000) per annum were allowed towards improving the Drainage, much might be done by the Committee, aided by your scientific knowledge and advice. If some plan be not adopted the evils which arise from the annual inundations of parts of Intally must continue, and in some severe season the lower parts of Calcutta even will be inundated from the stoppages of the passages in Intally, into which the Calcutta Drains empty themselves. Want of proper passages for such masses of water, and of labourers to keep them open, must be attended with the above results sooner or later—the whole of the Marhatta ditch being included in the Intally division, and into this ditch many of the tunnels and Drains of Calcutta empty themselves. The Committee beg to suggest that if coolies or many more convicts cannot be immediately allowed to them, that this ditch should be placed under the care of the Town Conservancy, which has a large establishment (on the Intally Bank of the ditch), and is better able to take care of this large ditch than the Intally Committee, with its limited means.

The Committee are encouraged to hope that the above suggestions will meet with the favourable consideration of Government in accordance with paragraph third of Mr. Deputy-Secretary Young's Letter to your address, No. 760, dated 28th April 1840.

In the fifth paragraph of the same letter, Mr. Deputy-Secretary Young calls upon the Committee to draw up such plan for local taxation and management as their knowledge of the district may suggest to them as most likely to be acceptable to the inhabitants and effective for the purposes in view. In furtherance of this object, I have the honour to subjoin a plan for the consideration of the Right Honourable the Governor of Bengal, which, if adopted, will, amongst others, embrace the following subjects, but if not adopted, or if much delay in its consideration and final adoption be anticipated, the Committee beg to submit the following as substantive propositions, and to solicit the sanction of Government thereto.

The Committee to have power to levy a fine not exceeding ten Rupces (10) on any person who shall without permission, place bricks, lime, sand, or other materials on the Roads, and refuse to remove the same when so required, thereby obstructing the free passage of the said Roads, and setting at defiance the remonstrances of the Committee.

The Magistrate to be instructed in case of contumacy to enforce payment of such fines with an additional fine not exceeding double the original amount, or otherwise support the authority of the Committee in such manner as may be deemed proper.

Also a similar power to fine or otherwise punish persons found cutting up the public Drains or bunding them for fishing or other purposes, or committing filthy nuisance on the Roads or in the Drains, or erecting temporary shops, or exposing goods for sale on the Roads so as to obstruct free passage on the same.

A Pound to be established at Intally Conservancy Ghowkhanna—there being no Pound nearer than Allipore—into which cattle found trespassing may be placed—with power to levy the usual fines, and under the same rules as obtain at Allipore Pound. The Pound to defray its own expenses.

The Committee to have power to fill up offensive pools or tanks, and to cut down trees or jungle growing in, or hanging over the public Drains or Roads.

In addition to the present establishment the Committee recommend the following as necessary to enable them to conduct the business of the Division under their charge.

A Clerk or writer at 60 per mensem, two Durwans for Ghowkhanna gates, at 5 each, ditto six Maters or sweepers for the Drains of the division to perform duties which neither the convicts nor the drivers will execute, at 4 per mensem.

I have the honour herewith to forward a Statement of the expenditure of last year, exhibiting a saving of Company's Rupees 42 : 14 : 5 on the estimate. Also an Estimate for the repairs of Roads, Bridges, Drains and Buildings for the present year ; and to state, that the Committee experienced great difficulty during last year in obtaining khoah of any kind at 10 Rs. per 10 [? 100] maunds, and that such as they did obtain was very inferior. They will not be able to obtain good khoah this year for less than 12 per 10 [? 100] maunds.

I beg to add, that although the Committee occasionally obtain the use of a Roller from the Town Conservancy establishment, they suffer inconvenience from the uncertainty of obtaining its loan, [I] beg again to repeat the wish of the Committee to be supplied with a powerful iron Roller for the use of the Intally district.

I have the honor to be,

Sir,

Your obedient servant,

(Signed) SAMUEL SMITH,

Chairman Intally Conservancy Committee.

No. 55. a.⁽¹⁾

Plan for the management of Conservancy and Municipal affairs of the Panchanogram, or the whole or such portions of the Suburbs of Calcutta as to the Right Honorable the Governor of Bengal may seem proper.

Intally, 9th February, 1841.

1. That the Conservancy and all local matters (Police excepted) of Panchanogram (or as may be) be confided to the management of a general Board or Council to be denominated the Suburban Council or Board of Conservancy, and four (more or less as per margin) Division Committees.

2. That the Board of Council shall consist of the Magistrate as President, the Chairman of the Division Committees as Vice-Presidents, and the Members of Committees as

common Councillors, with power to levy an Assessment annually not exceeding 5 per cent. upon the annual value of all houses or lands within its jurisdiction.

3. That the Division Committees shall consist of five Members, to be elected by the inhabitants paying a monthly Rent of 20 Rupees (or occupying houses of an equal or superior value), one of whom shall be by them chosen as their Chairman.

4. That to these Committees shall be entrusted the supervision of their own divisions, subject to the general control of the Board or Council.

5. That the Board shall have power to appoint a Collector of Assessment, a Superintendent of the Roads, a Head Clerk, and such minor establishments as it may seem necessary. The two first named appointments to be subject to the approval of the Right Honorable the Governor of Bengal, and to be notified in the Official Gazette.

6. That all Collections of Assessment be daily deposited in the Bank of Bengal or Union Bank of Calcutta as may be ordered, and all disbursements drawn therefrom by Cheques signed by the President or Vice-President (presiding), and countersigned by the Chief Clerk.

7. That the Meetings of the Board or Council shall be held at such central part of the Suburbs as may be decided on, and that the Division Committees do meet at some convenient place within their respective division, as may be agreed upon. The expense (if any) thereby incurred, and the salaries of such establishment as may be approved of by the Board, be defrayed out of the general funds.*

8. That Annual Reports of the proceedings of the Board or Council be made to Government, and that the accounts be audited and published quarterly for the information of the inhabitants.

9. That the Civil Architect, the Superintendent of Canals, and the Deputy Collector of Panchanogram be ex-officio Members of the Suburban Board or Council.

N. B.—To give effect to the above Plan, it will be necessary to vest in Suburban Landlords the same power of distraint for rent as is possessed by Landlords in Calcutta, and generally to put inhabitants of the Suburbs in the same position as the inhabitants of the Metropolis, otherwise they will petition against the proposed assessment.

If the limits of Calcutta should be extended, so as to include the Panchanogram, the above plan would require to be somewhat modified, and the Magistrate of the Suburbs, whether a civilian or person not in the East India Company's service, should not be the Magistrate of the 24-Pergunnahs, but might still be President of the Suburban Board or Council which might then undertake the Police duties also as in Calcutta.

MEMO. OF PROBABLE ESTABLISHMENT.

Suburban Board or Council.

	Per mensem.			
The Magistrate as President, (ex-officio.)				
The Vice-President, (Honorary.)				
Collector and Assessor of Assessments, a Commissioner,	400	0 0
Superintendent of Roads,	300	0 0
Head Clerk,	200	0 0
Minor Establishment,	100	0 0

Co's. Rs. 1,000				0 0

* Accommodation may be found, as at the Intally Division, free of charge. The Committee now meet at a house in the Gowkhana premises.

Division Committees.

Overseer Serjeant,	100	0	0
Clerk to Committee,	60	0	0
Six Peons, at 5,	30	0	0
Six Sweepers, at 4,	24	0	0
Two Durwans, at 4,	8	0	0
Two Dooks, at 4,	8	0	0
Thirty Drivers, at 4,	120	0	0
Thirty Bullocks feed, at 4,	120	0	0
Stationery and petty expences (say)	30	0	0
	<hr/>		
	Co's.	Rs.	500 0 0
	<hr/>		

N. B.—The numbers of Bullocks, Drivers, Sweepers, and Peons, must depend upon the extent of the division ; the above being the maximum.

F I N I S.